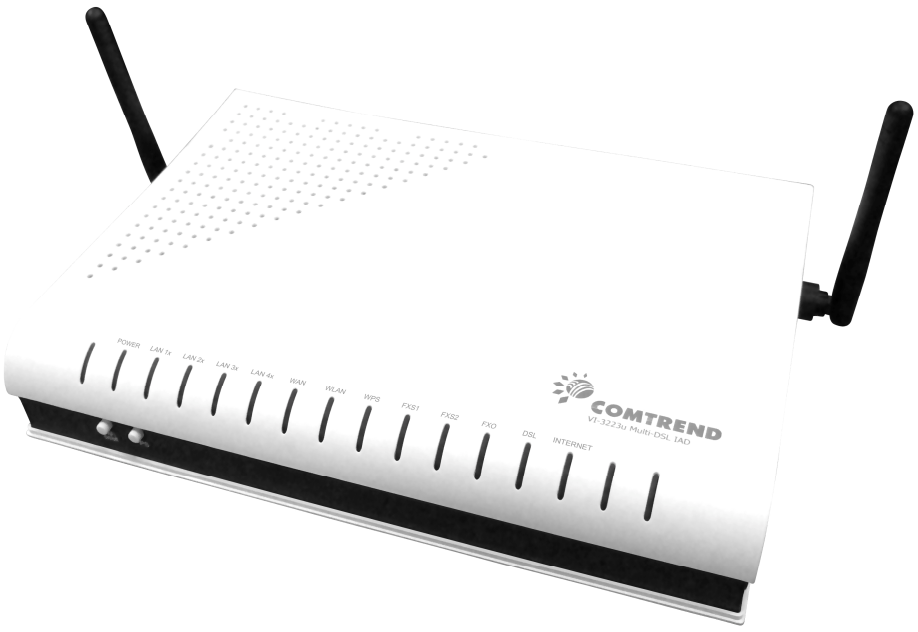
COMTREND CORPORATION

VI-3223u
Multi-DSL WLAN IAD
User Manual

Version B1.0, July 19, 2013



261099-020

Preface

This manual provides information related to the installation and operation of this device. The individual reading this manual is presumed to have a basic understanding of telecommunications terminology and concepts.

If you find the product to be inoperable or malfunctioning, please contact technical support for immediate service by email at INT-support@comtrend.com

For product update, new product release, manual revision, or software upgrades, please visit our website at http://www.comtrend.com

Important Safety Instructions

With reference to unpacking, installation, use, and maintenance of your electronic device, the following basic guidelines are recommended:

- Do not use or install this product near water, to avoid fire or shock hazard. For example, near a bathtub, kitchen sink or laundry tub, or near a swimming pool. Also, do not expose the equipment to rain or damp areas (e.g. a wet basement).
- Do not connect the power supply cord on elevated surfaces. Allow it to lie freely. There should be no obstructions in its path and no heavy items should be placed on the cord. In addition, do not walk on, step on, or mistreat the cord.
- Use only the power cord and adapter that are shipped with this device.
- To safeguard the equipment against overheating, make sure that all openings in the unit that offer exposure to air are not blocked.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightening. Also, do not use the telephone to report a gas leak in the vicinity of the leak.
- Never install telephone wiring during stormy weather conditions.

CAUTION:

- To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.
- Always disconnect all telephone lines from the wall outlet before servicing or disassembling this equipment.

WARNING

- Disconnect the power line from the device before servicing.
- Power supply specifications are clearly stated in Appendix D - Specifications

Copyright

Copyright© 2013 Comtrend Corporation. All rights reserved. The information contained herein is proprietary to Comtrend Corporation. No part of this document may be translated, transcribed, reproduced, in any form, or by any means without the prior written consent of Comtrend Corporation.

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program. If not, see http://www.gnu.org/licenses/

NOTE:	This document is subject to change without notice.

Protect Our Environment

This symbol indicates that when the equipment has reached the end of its useful life, it must be taken to a recycling centre and processed separate from domestic waste.

The cardboard box, the plastic contained in the packaging, and the parts that make up this router can be recycled in accordance with regionally established regulations. Never dispose of this electronic equipment along with your household waste; you may be subject to penalties or sanctions under the law. Instead, please be responsible and ask for disposal instructions from your local government.

Table of Contents

CHAPTER 1 INTRODUCTION 5
1.1 FEATURES 5
1.2 APPLICATION 6

CHAPTER 2 INSTALLATION 7
2.1 HARDWARE SETUP 7
2.2 LED INDICATORS 9

CHAPTER 3 WEB USER INTERFACE 11
3.1 DEFAULT SETTINGS 11
3.2 IP CONFIGURATION 11
3.3 LOGIN PROCEDURE 14

CHAPTER 4 DEVICE INFORMATION 16
4.1 WAN 17
4.2 STATISTICS 18
4.2.1 LAN Statistics 18
4.2.2 WAN Statistics 19
4.2.3 xTM Statistics 20
4.2.4 xDSL Statistics 21
4.3 ROUTE 27
4.4 ARP 28
4.5 DHCP 29
4.6 NAT SESSION 30

CHAPTER 5 ADVANCED SETUP 31
5.1 LAYER 2 INTERFACE 32
5.1.1 ATM Interface 32
5.1.2 PTM Interface 33
5.1.3 ETH Interface 33
5.2 WAN SERVICE 34
5.3 LAN 35
5.4 NAT 37
5.4.1 Virtual Servers 37
5.4.2 Port Triggering 38
5.4.3 DMZ Host 40
5.4.4 IP Address Map 41
5.5 SECURITY 43
5.5.1 IP Filtering 43
5.5.2 MAC Filtering 46
5.6 PARENTAL CONTROL 48
5.6.1 Time Restriction 48
5.6.2 URL Filter 49
5.7 QUALITY OF SERVICE (QOS) 50
5.7.1 Queue Management Configuration 50
5.7.2 Queue Configuration 52
5.7.3 QoS Classification 54
5.8 ROUTING 56
5.8.1 Default Gateway 56
5.8.2 Static Route 57
5.8.3 Policy Routing 58
5.8.4 RIP 59
5.9 DNS 60
5.9.1 DNS Server 60
5.9.2 Dynamic DNS 61
5.10 DSL 63
5.11 UPNP 66
5.12 DNS PROXY 67
5.13 PRINT SERVER 68

5.14 DLNA 69
5.15 STORAGE SERVICE 70
5.15.1 Storage Device Info *71*
5.16 INTERFACE GROUPING 72
5.17 IPSEC 75
5.18 CERTIFICATE 79
5.18.1 Local *79*
5.18.2 Trusted CA *82*
5.19 MULTICAST 83

CHAPTER 6 WIRELESS 84
6.1 BASIC 84
6.2 SECURITY 86
6.2.1 WPS *89*
6.3 MAC FILTER 93
6.4 WIRELESS BRIDGE 94
6.5 ADVANCED 95
6.6 STATION INFO 99

CHAPTER 7 VOICE 100
7.1 SIP BASIC SETTING 101
7.1.1 Global Parameters *101*
7.1.2 Service Provider *102*
7.2 SIP ADVANCED 104
7.2.1 Global Parameters *105*
7.2.2 Service Provider *106*
7.3 SIP DEBUG 108
7.3.1 Global Parameters *108*
7.3.2 Service Provider *109*
7.4 TELEPHONE CALLS 110

CHAPTER 8 DIAGNOSTICS 112
8.1 FAULT MANAGEMENT 113

CHAPTER 9 MANAGEMENT 115
9.1 SETTINGS 115
9.1.1 Backup Settings *115*
9.1.2 Update Settings *115*
9.1.3 Restore Default *116*
9.2 SYSTEM LOG 117
9.3 SNMP AGENT 119
9.4 TR-069 CLIENT 120
9.5 INTERNET TIME 122
9.6 ACCESS CONTROL 123
9.6.1 Passwords *123*
9.6.2 Services *124*
9.6.3 Services *125*
9.7 UPDATE SOFTWARE 127
9.8 REBOOT 128

APPENDIX A - FIREWALL 129

APPENDIX B - PIN ASSIGNMENTS 132

APPENDIX C – SSH CLIENT 133

APPENDIX D - SPECIFICATIONS 134

APPENDIX E - WPS EXTERNAL REGISTRAR 136

APPENDIX F - PRINTER SERVER 139

APPENDIX G - CONNECTION SETUP 145

Chapter 1 Introduction

The VI-3223u Multi-DSL WLAN IAD provides wired and wireless access for high-bandwidth applications in the home or office. It includes four RJ-45 Ethernet LAN ports and supports ADSL2+ and VDSL2 connections through one RJ-11 port. ADSL2+ connections support multiple simultaneously Internet connections while VDSL2 connections are suitable for triple play (Video + Voice + Data) applications.

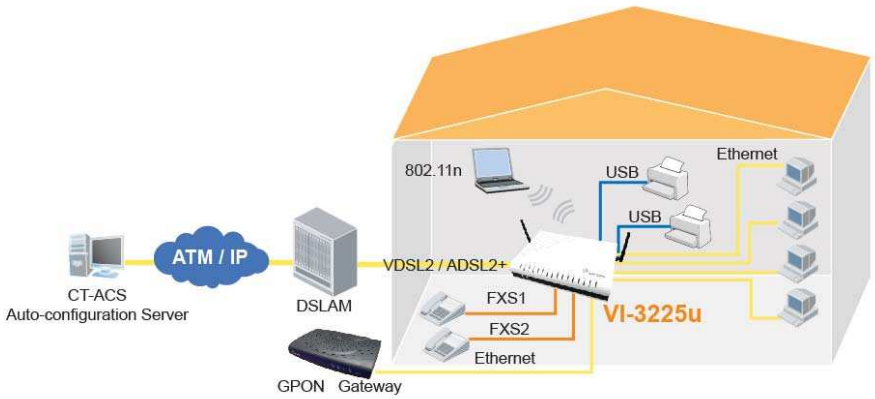
An integrated 802.11n (draft) WLAN Access Point (AP) provides faster wireless connections with increased range, when compared with 802.11b and 802.11g, without sacrificing backwards compatibility with these older wireless standards. WPS (Wi-Fi Protected Setup) and Wi-Fi On/Off buttons are positioned on the front panel for easy wireless network setup and control.

1.1 Features

- Integrated 802.11n AP (802.11b/g backward-compatible)
- VI-3223u - Annex A
- VDSL2 17a profile support
- IP and Per-VC packet level QoS
- WAP and 802.1x
- RADIUS client
- Static routing & RIP/RIP v2
- NAT/PAT
- IGMP Proxy and fast leave
- Web-based management
- Supports remote administration
- Configuration backup and restoration
- Firmware upgrade and configuration
- IP QoS
- Automatic ADSL2+ / VDSL2 switching based on DSLAM setting
- Supports VPN Pass-Through
- Supports T.38
- Auto PVC configuration
- IP/MAC filtering
- Dynamic IP assignment
- Supports Parental Control
- DHCP Server/Relay/Client
- Supports caller ID display and restriction
- Supports Direct number dialing
- FTP/TFTP server
- TR-069/TR-098/TR-104/TR-111
- Supports QoS (Quality of Service) for voice

1.2 Application

The following diagram depicts a typical application of the VI-3223u.



Chapter 2 Installation

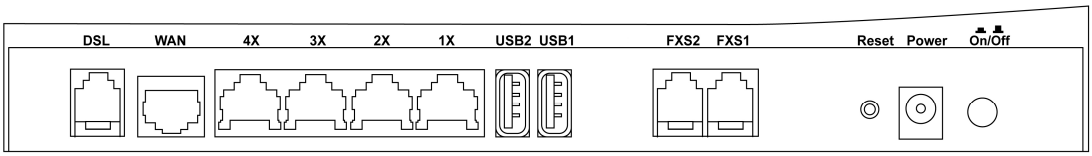
2.1 Hardware Setup

Follow the instructions below to complete the hardware setup.

Non-stackable
This device is not stackable – do not place units on top of each other, otherwise damage could occur.

BACK PANEL

The figure below shows the back panel of the device.



DSL Port
Connect the ADSL2+/VDSL line to this port with a RJ-11 (telephone) cable.

WAN Port
Connect to the Internet source using an RJ-45 cable.

LAN PORTS
Use 1000-BASE-T RJ-45 cables to connect up to four network devices to a Gigabit LAN, or 10/100BASE-T RJ-45 cables for slower networks. As these ports are auto-sensing MDI/X, either straight-through or crossover cable can be used.

USB HOST PORTS
Two USB 2.0 host ports support compatible printers. See Appendix G for setup instructions. Support for other devices may be added in future firmware upgrades.

FXS Ports
For VoIP service, connect telephone(s) to these ports with RJ11 cable.

Reset Button
Restore the default parameters of the device by pressing the Reset button for 5 to 10 seconds. After the device has rebooted successfully, the front panel should display as expected (see section 2.2 LED Indicators).

NOTE:	If pressed down for more than 20 seconds, the VI-3223u will go into a firmware update state (CFE boot mode). The firmware can then be updated using an Internet browser pointed to the default IP address.

Power ON
Press the power button to the OFF position (OUT). Connect the power adapter to the power port. Attach the power adapter to a wall outlet or other AC source. Press the power button to the ON position (IN). If the Power LED displays as expected then the device is ready for setup (see section 2.2 LED Indicators).

Caution 1:	If the device fails to power up, or it malfunctions, first verify that the power cords are connected securely. Then power it on again. If the problem persists, contact technical support.
Caution 2:	Before servicing or disassembling this equipment, disconnect all power cords and telephone lines from their outlets.

FRONT PANEL

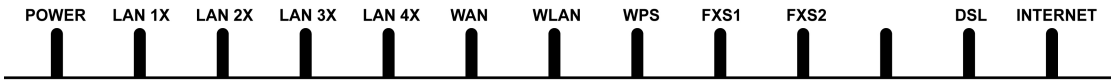
The WiFi & WPS buttons are located on the left side of the front panel, as shown.

Wi-Fi Button
Press this button to enable/disable the wireless LAN (WLAN).

WPS Button
Press this button to begin searching for WPS clients. These clients must also enable WPS push button mode. When WPS is available the WPS LED will be ON.

2.2 LED Indicators

The front panel LED indicators are shown below and explained in the following table. This information can be used to check the status of the device and its connections.



LED	Color	Mode	Function
POWER	Green	On	The device is powered up.
		Off	The device is powered down.
		Blink	The device is flashing new firmware.
	Red	On	POST (Power On Self Test) failure or other malfunction. A malfunction is any error of internal sequence or state that will prevent the device from connecting to the DSLAM or passing customer data.
	Amber	On	When the reset button is held in for five seconds to reset the modem to factory default, the power light should go amber (blink for 1 second) to indicate factory reset is ready.
LAN 1X-4X	Green	On	An Ethernet Link is established.
		Off	An Ethernet Link is not established.
		Blink	Data transmitting or receiving over LAN.
WAN	Red	On	An Ethernet Link is established at 1000 Mbps.
		Off	An Ethernet Link is not established.
		Blink	Data transmitting or receiving over Ethernet WAN.
	Green	On	An Ethernet WAN Link is established at 10/100 Mbps.
		Off	An Ethernet WAN Link is not established.
		Blink	Data transmitting or receiving over Ethernet WAN.
WLAN	Green	On	The wireless module is ready. (i.e. installed and enabled).
		Off	The wireless module is not ready. (i.e. either not installed or disabled).
		Blink	Data transmitting or receiving over WLAN.
WPS	Green	On	WPS enabled and PC connected to WLAN
		Off	• WPS disenabled when WPS configured • After clients connected to router about 5 minutes, LED is OFF.
		Blink	The router is searching for WPS clients or WPS un-configured.
FXS	Green	On	FXS phone line is off hook.

		Off	FXS phone line is on hook.
DSL	Green	On	The DSL link is established.
		Off	DSL is not ready / modem is still booting.
		Blink	Slow(2Hz) The DSL link is ready for connection. Fast(4Hz) DSL Link is training.
INTERNET	Green	On	IP connected and no traffic detected. If an IP or PPPoE session is dropped due to an idle timeout, the light will remain green if an ADSL connection is still present.
		Off	Modem power off, modem in bridged mode or ADSL connection not present. In addition, if an IP or PPPoE session is dropped for any reason, other than an idle timeout, the light is turned off.
		Blink	IP connected and IP Traffic is passing thru the device (either direction)
	Red	On	Device attempted to become IP connected and failed (no DHCP response, no PPPoE response, PPPoE authentication failed, no IP address from IPCP, etc.)

Chapter 3 Web User Interface

This section describes how to access the device via the web user interface (WUI) using an Internet browser such as Internet Explorer (version 5.0 and later).

3.1 Default Settings

The factory default settings of this device are summarized below.

- LAN IP address: 192.168.1.1
- LAN subnet mask: 255.255.255.0
- Administrative access (username: **root** , password: **12345**)
- User access (username: **user**, password: **user**)
- Remote (WAN) access (username: **support**, password: **support**)
- WLAN access: **enabled**

Technical Note

During power on, the device initializes all settings to default values. It will then read the configuration profile from the permanent storage section of flash memory. The default attributes are overwritten when identical attributes with different values are configured. The configuration profile in permanent storage can be created via the web user interface or telnet user interface, or other management protocols. The factory default configuration can be restored either by pushing the reset button for more than five seconds until the power indicates LED blinking or by clicking the Restore Default Configuration option in the Restore Settings screen.

3.2 IP Configuration

DHCP MODE

When the VI-3223u powers up, the onboard DHCP server will switch on. Basically, the DHCP server issues and reserves IP addresses for LAN devices, such as your PC.

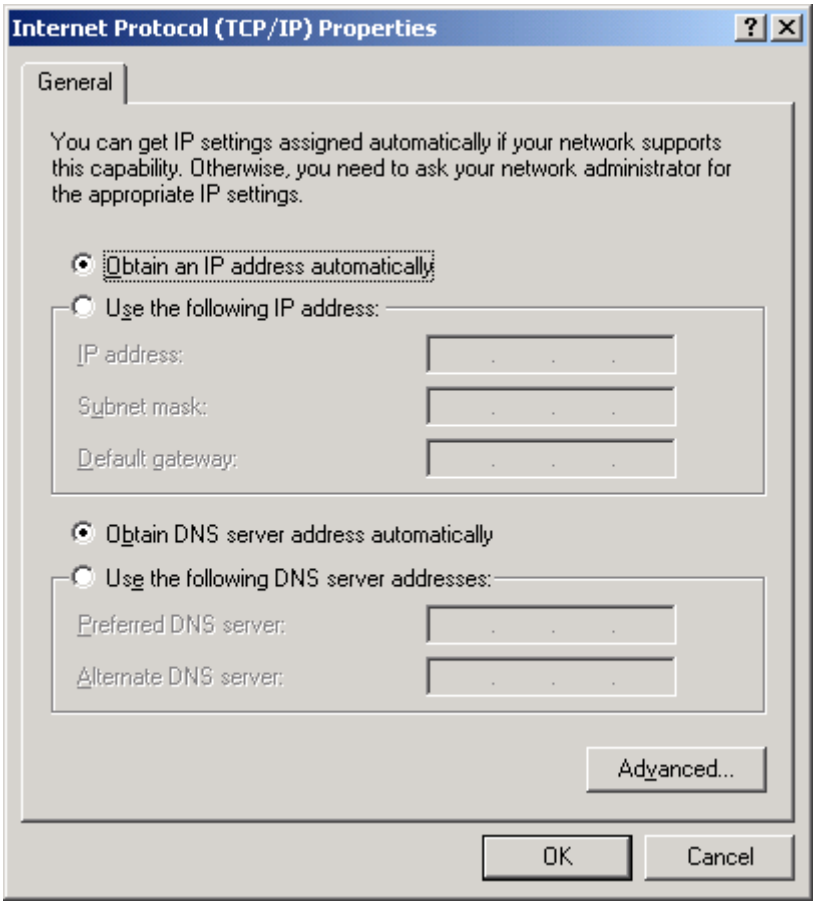
To obtain an IP address from the DCHP server, follow the steps provided below.

NOTE:	The following procedure assumes you are running Windows XP. However, the general steps involved are similar for most operating systems (OS). Check your OS support documentation for further details.

STEP 1: From the Network Connections window, open Local Area Connection (*You may also access this screen by double-clicking the Local Area Connection icon on your taskbar*). Click the **Properties** button.

STEP 2: Select Internet Protocol (TCP/IP) **and click the** Properties button.

STEP 3: Select Obtain an IP address automatically as shown below.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

STEP 4: Click **OK** to submit these settings.

If you experience difficulty with DHCP mode, you can try static IP mode instead.

STATIC IP MODE

In static IP mode, you assign IP settings to your PC manually.

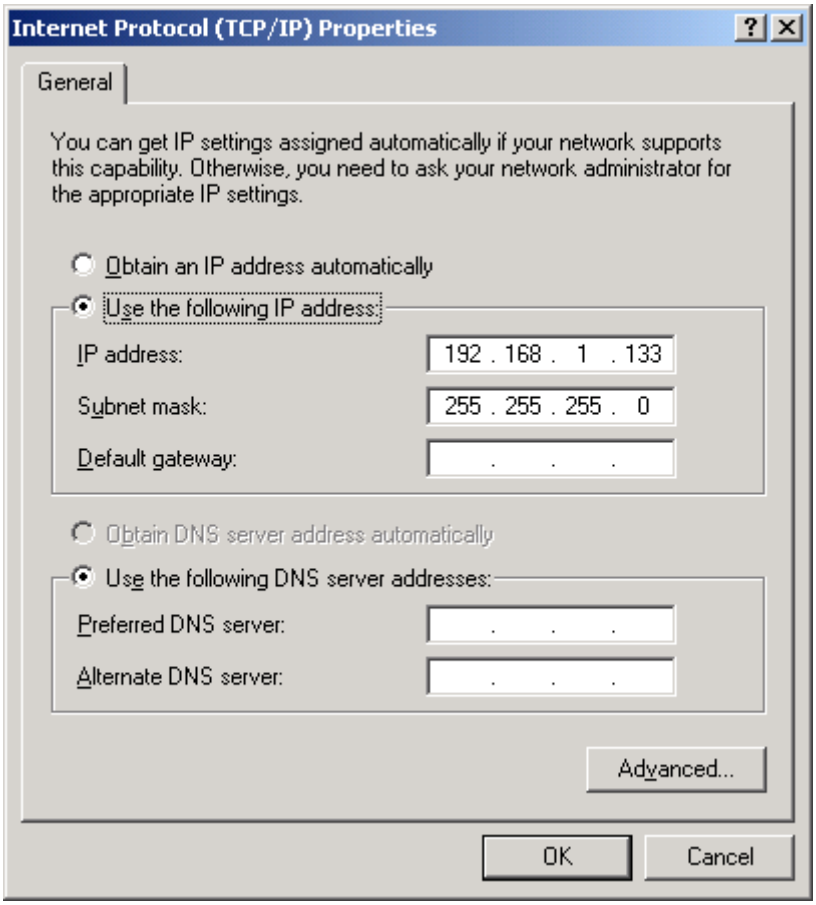
Follow these steps to configure your PC IP address to use subnet 192.168.1.x.

NOTE:	The following procedure assumes you are running Windows XP. However, the general steps involved are similar for most operating systems (OS). Check your OS support documentation for further details.

STEP 1: From the Network Connections window, open Local Area Connection (*You may also access this screen by double-clicking the Local Area Connection icon on your taskbar*). Click the **Properties** button.

STEP 2: Select Internet Protocol (TCP/IP) **and click the** Properties button.

STEP 3: Change the IP address to the 192.168.1.x (1<x<255) subnet with subnet mask of 255.255.255.0. The screen should now display as shown below.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 1 . 133
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

STEP 4: Click **OK** to submit these settings.

3.3 Login Procedure

Perform the following steps to login to the web user interface.

NOTE:	The default settings can be found in 3.1 Default Settings.

STEP 1: Start the Internet browser and enter the default IP address for the device in the Web address field. For example, if the default IP address is 192.168.1.1, type http://192.168.1.1.

NOTE:	For local administration (i.e. LAN access), the PC running the browser must be attached to the Ethernet, and not necessarily to the device. For remote access (i.e. WAN), use the IP address shown on the Chapter 4 Device Information screen and login with remote username and password.

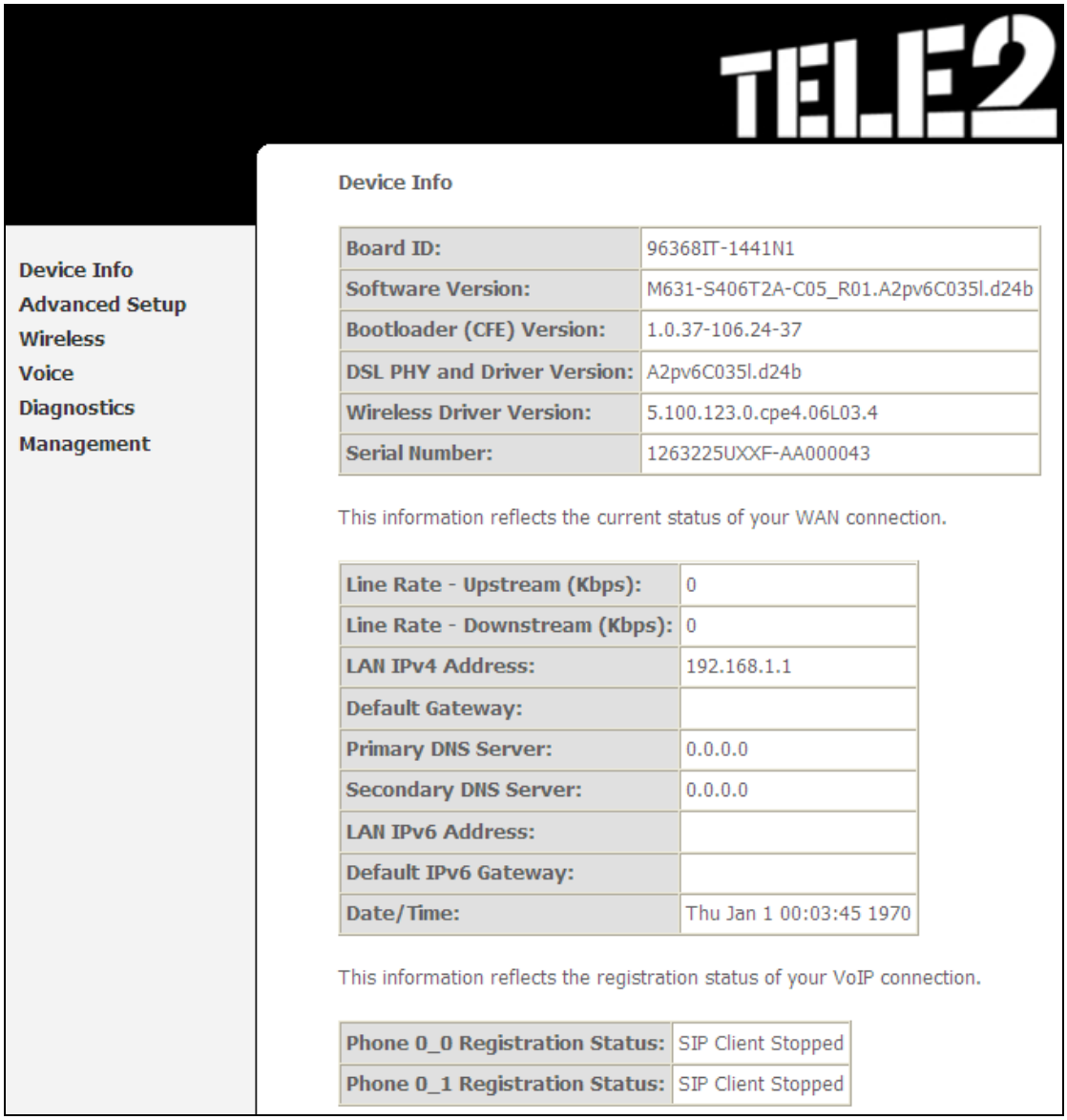
STEP 2: A dialog box will appear, such as the one below. Enter the default username and password, as defined in section 3.1 Default Settings.

Connect to 192.168.1.1
The server 192.168.1.1 at DSL Router requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
root
Password:
Remember my password
OK
Cancel

Click **OK** to continue.

NOTE:	The login password can be changed later (see 9.6.1 Passwords).

STEP 3: After successfully logging in for the first time, you will reach this screen.



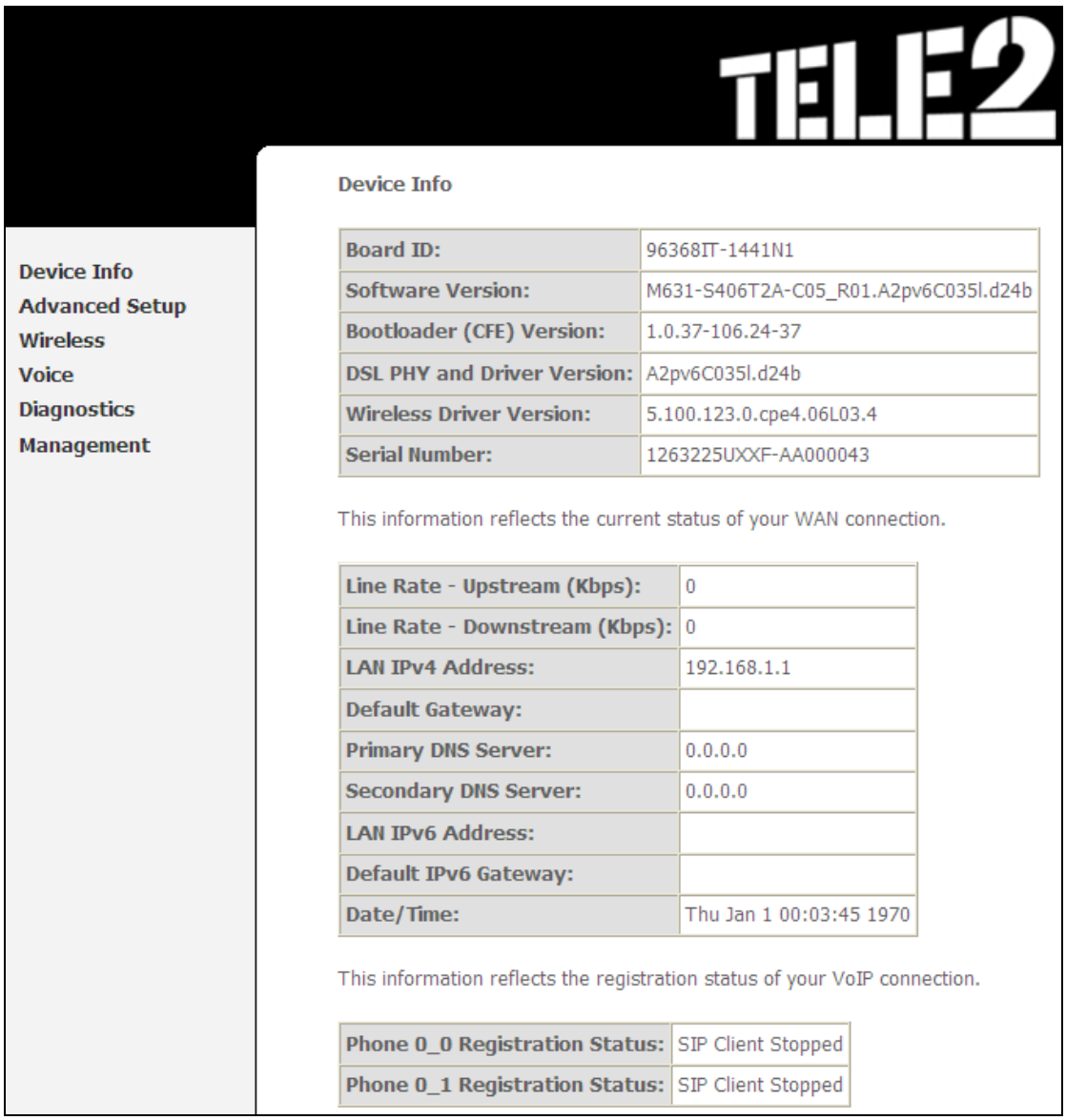
Chapter 4 Device Information

The web user interface window is divided into two frames, the main menu (at left) and the display screen (on the right). The main menu has several options and selecting each of these options opens a submenu with more selections.

NOTE:	The menu items shown are based upon the configured connection(s) and user account privileges. For example, if NAT and Firewall are enabled, the main menu will display the NAT and Security submenus. If either is disabled, their corresponding menu(s) will also be disabled.

Device Info is the first selection on the main menu so it will be discussed first. Subsequent chapters will introduce the other main menu options in sequence.

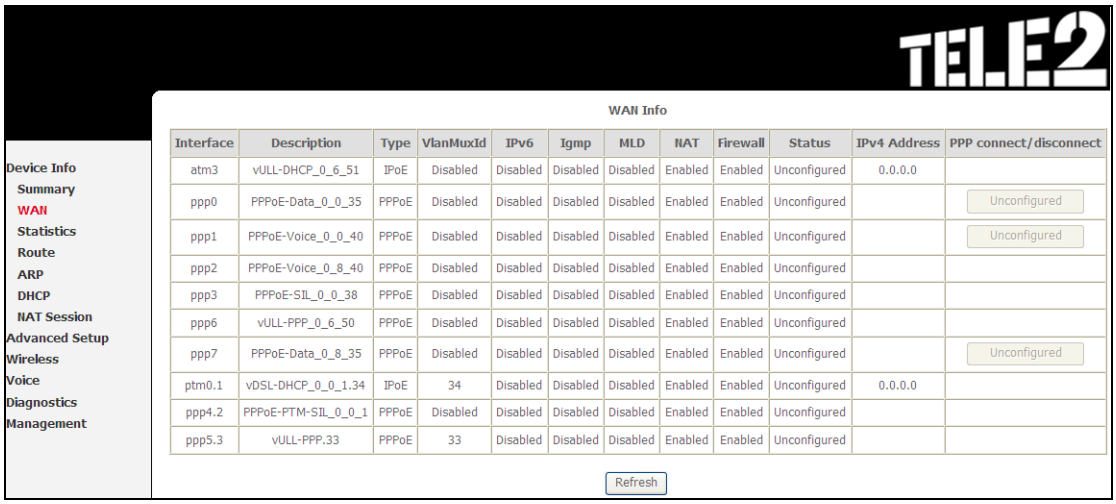
The Device Info Summary screen displays at startup.



This screen shows hardware, software, IP settings and other related information.

4.1 WAN

Select WAN from the Device Info submenu to display the configured PVC(s).


TELE2
Device Info
Summary
WAN
Statistics
Route
ARP
DHCP
NAT Session
Advanced Setup
Wireless
Voice
Diagnostics
Management
WAN Info
Interface | Description | Type | VlanMuxId | IPv6 | Igmp | MLD | NAT | Firewall | Status | IPv4 Address | PPP connect/disconnect
atm3 | vULL-DHCP_0_6_51 | IPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured | 0.0.0.0
ppp0 | PPPoE-Data_0_0_35 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured | Unconfigured
ppp1 | PPPoE-Voice_0_0_40 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured | Unconfigured
ppp2 | PPPoE-Voice_0_8_40 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured
ppp3 | PPPoE-SIL_0_0_38 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured
ppp6 | vULL-PPP_0_6_50 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured
ppp7 | PPPoE-Data_0_8_35 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured | Unconfigured
ptm0.1 | vDSL-DHCP_0_0_1.34 | IPoE | 34 | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured | 0.0.0.0
ppp4.2 | PPPoE-PTM-SIL_0_0_1 | PPPoE | Disabled | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured
ppp5.3 | vULL-PPP.33 | PPPoE | 33 | Disabled | Disabled | Disabled | Enabled | Enabled | Unconfigured
Refresh

Heading	Description
Interface	Name of the interface for WAN
Description	Name of the WAN connection
Type	Shows the connection type
VlanMuxId	Shows 802.1Q VLAN ID
IPv6	Shows WAN IPv6 address
IGMP	Shows Internet Group Management Protocol (IGMP) status
MLD	Shows Multicast Listener Discovery (MLD) status
NAT	Shows Network Address Translation (NAT) status
Firewall	Shows the status of Firewall
Status	Lists the status of DSL link
IPv4 Address	Shows WAN IPv4 address
PPP connect/disconnect	Shows the PPP connection status

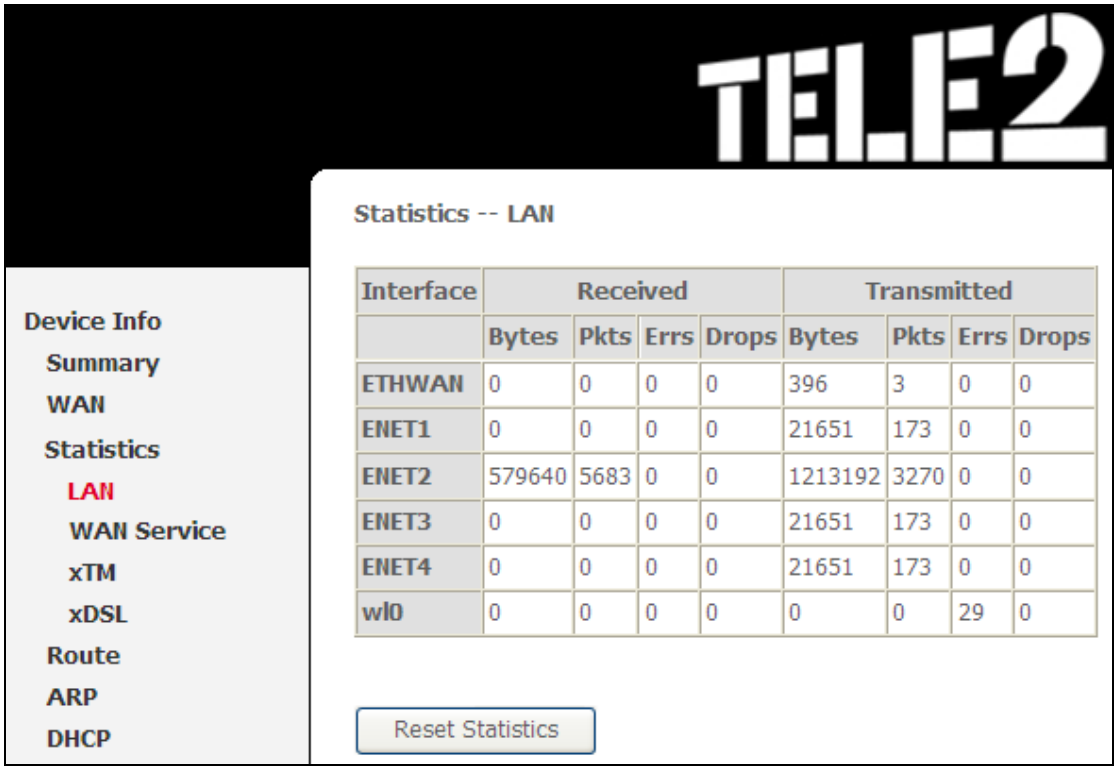
4.2 Statistics

This selection provides LAN, WAN, ATM/PTM and xDSL statistics.

NOTE:	These screens are updated automatically every 15 seconds. Click **Reset Statistics** to perform a manual update.

4.2.1 LAN Statistics

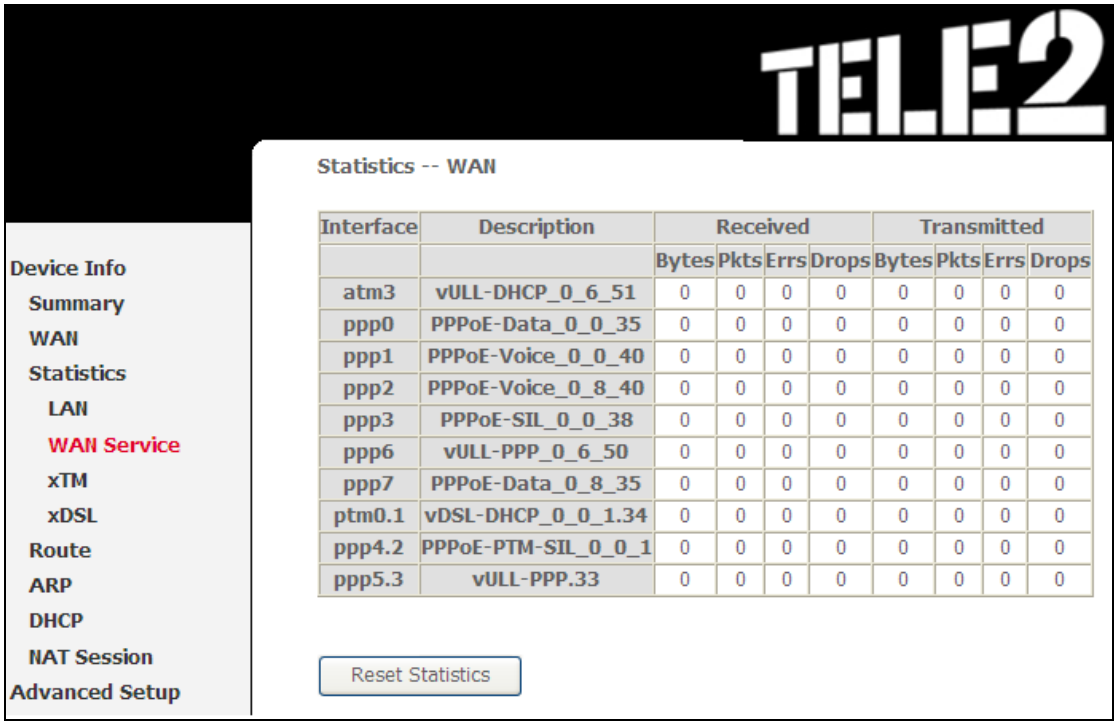
This screen shows data traffic statistics for each LAN interface.



Heading		Description
Interface		LAN interface(s)
Received/Transmitted:	- Bytes - Pkts - Errs - Drops	Number of Bytes Number of Packets Number of packets with errors Number of dropped packets

4.2.2 WAN Statistics

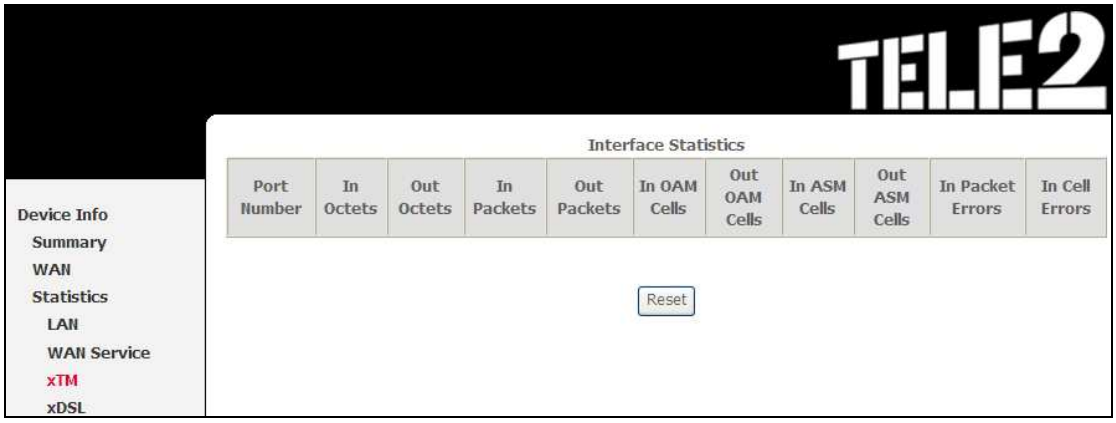
This screen shows data traffic statistics for each WAN interface.



Heading		Description
Interface		WAN interfaces
Description		WAN service label
Received/Transmitted	- Bytes - Pkts - Errs - Drops	Number of Bytes Number of Packets Number of packets with errors Number of dropped packets

4.2.3 xTM Statistics

The following figure shows Asynchronous Transfer Mode (xTM) statistics.

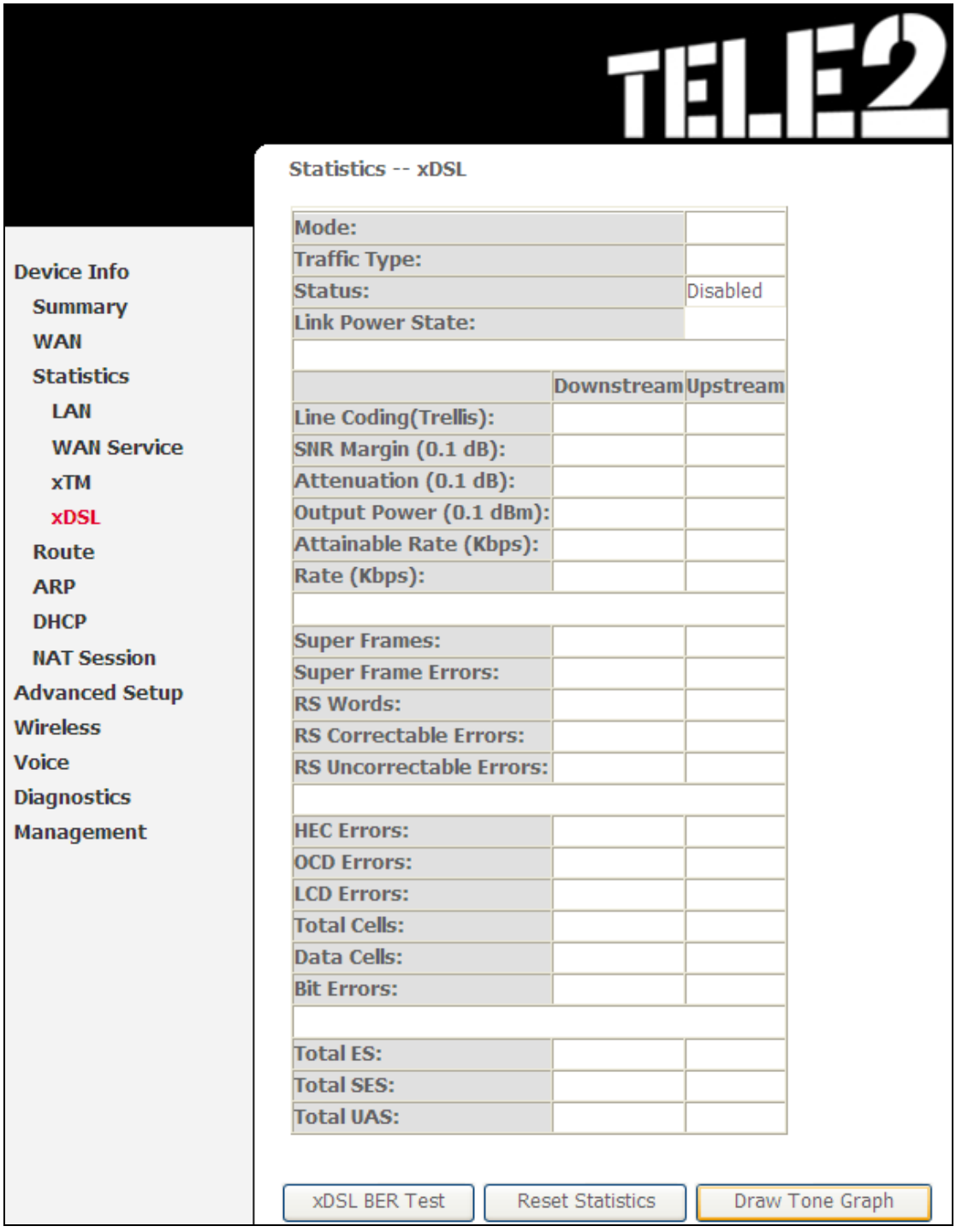


ATM Interface Statistics

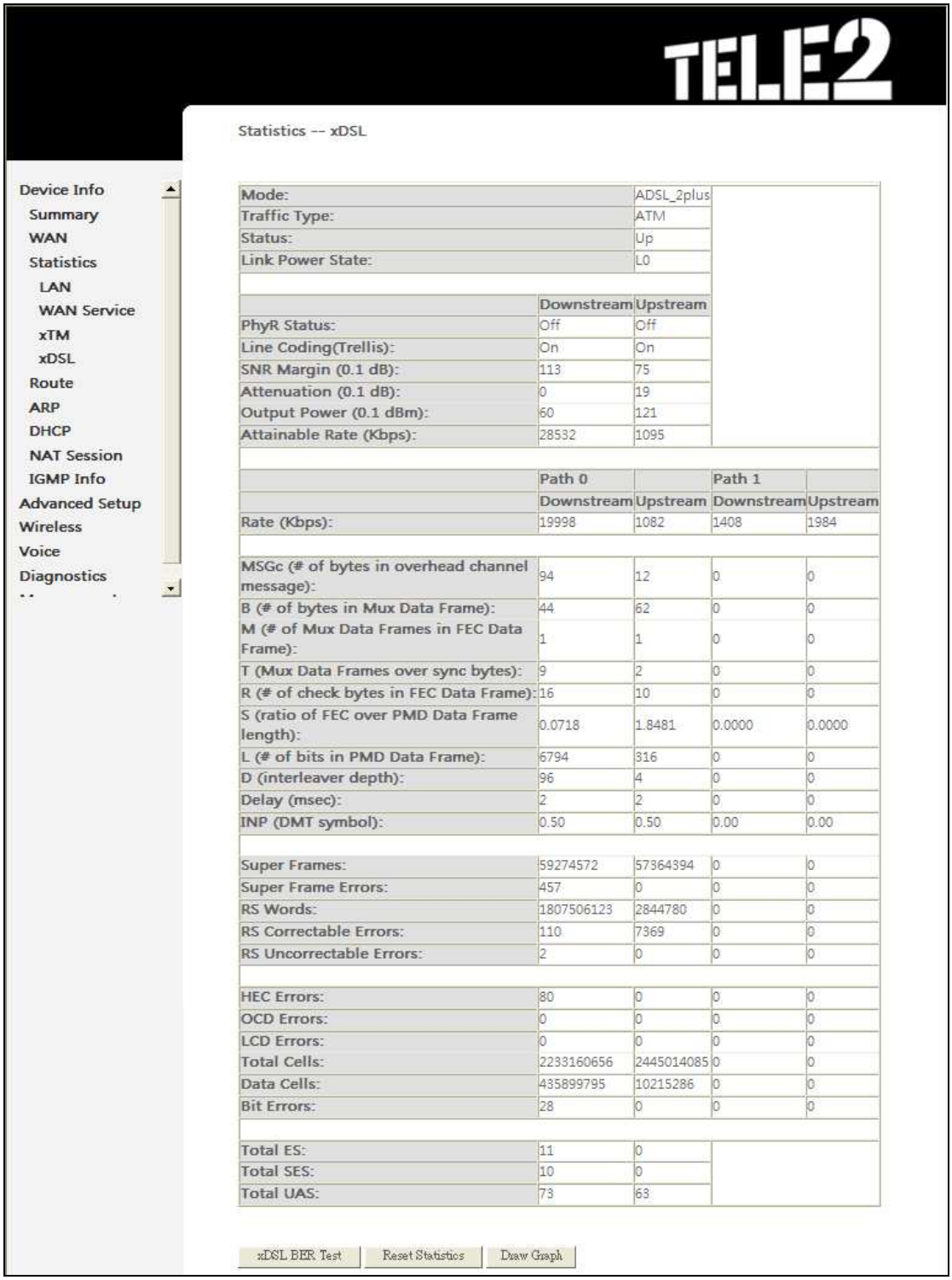
Heading	Description
Port Number	ATM PORT (0-3)
In Octets	Number of octets received over the interface
Out Octets	Number of octets transmitted over the interface
In Packets	Number of packets received over the interface
Out Packets	Number of packets transmitted over the interface
In OAM Cells	Number of OAM Cells received over the interface
Out OAM Cells	Number of OAM Cells transmitted over the interface
In ASM Cells	Number of ASM Cells received over the interface
Out ASM Cells	Number of ASM Cells transmitted over the interface
In Packet Errors	Number of packets in Error
In Cell Errors	Number of cells in Error.

4.2.4 xDSL Statistics

The xDSL Statistics screen displays information corresponding to the xDSL type.



The **ADSL** example is shown below.


TELE2
Statistics -- xDSL
Device Info
Summary
WAN
Statistics
LAN
WAN Service
xTM
xDSL
Route
ARP
DHCP
NAT Session
IGMP Info
Advanced Setup
Wireless
Voice
Diagnostics
Mode: ADSL_2plus
Traffic Type: ATM
Status: Up
Link Power State: L0
Downstream Upstream
PhyR Status: Off Off
Line Coding(Trellis): On On
SNR Margin (0.1 dB): 113 75
Attenuation (0.1 dB): 0 19
Output Power (0.1 dBm): 60 121
Attainable Rate (Kbps): 28532 1095
Path 0 Path 1
Downstream Upstream Downstream Upstream
Rate (Kbps): 19998 1082 1408 1984
MSGc (# of bytes in overhead channel message): 94 12 0 0
B (# of bytes in Mux Data Frame): 44 62 0 0
M (# of Mux Data Frames in FEC Data Frame): 1 1 0 0
T (Mux Data Frames over sync bytes): 9 2 0 0
R (# of check bytes in FEC Data Frame): 16 10 0 0
S (ratio of FEC over PMD Data Frame length): 0.0718 1.8481 0.0000 0.0000
L (# of bits in PMD Data Frame): 6794 316 0 0
D (interleaver depth): 96 4 0 0
Delay (msec): 2 2 0 0
INP (DMT symbol): 0.50 0.50 0.00 0.00
Super Frames: 59274572 57364394 0 0
Super Frame Errors: 457 0 0 0
RS Words: 1807506123 2844780 0 0
RS Correctable Errors: 110 7369 0 0
RS Uncorrectable Errors: 2 0 0 0
HEC Errors: 80 0 0 0
OCD Errors: 0 0 0 0
LCD Errors: 0 0 0 0
Total Cells: 2233160656 2445014085 0 0
Data Cells: 435899795 10215286 0 0
Bit Errors: 28 0 0 0
Total ES: 11 0
Total SES: 10 0
Total UAS: 73 63
xDSL BER Test
Reset Statistics
Draw Graph

Click the **Reset Statistics** button to refresh this screen.

Field	Description
Mode	G.Dmt, G.lite, T1.413, ADSL2, ADSL2+,VDSL, VDSL2
Traffic Type	Channel type Interleave or Fast
Status	Lists the status of the DSL link
Link Power State	Link output power state.

Line Coding (Trellis)	Trellis On/Off
SNR Margin (0.1 dB)	Signal to Noise Ratio (SNR) margin
Attenuation (0.1 dB)	Estimate of average loop attenuation in the downstream direction.
Output Power (0.1 dBm)	Total upstream output power
Attainable Rate (Kbps)	The sync rate you would obtain.
Rate (Kbps)	Current sync rates downstream/upstream

In VDSL mode, the following section is inserted.

B	Number of bytes in Mux Data Frame
M	Number of Mux Data Frames in a RS codeword
T	Number of Mux Data Frames in an OH sub-frame
R	Number of redundancy bytes in the RS codeword
S	Number of data symbols the RS codeword spans
L	Number of bits transmitted in each data symbol
D	The interleaver depth
I	The interleaver block size in bytes
N	RS codeword size
Delay	The delay in milliseconds (msec)
INP	DMT symbol

In ADSL2+ mode, the following section is inserted.

MSGc	Number of bytes in overhead channel message
B	Number of bytes in Mux Data Frame
M	Number of Mux Data Frames in FEC Data Frame
T	Mux Data Frames over sync bytes
R	Number of check bytes in FEC Data Frame
S	Ratio of FEC over PMD Data Frame length
L	Number of bits in PMD Data Frame
D	The interleaver depth
Delay	The delay in milliseconds (msec)
INP	DMT symbol

In G.DMT mode, the following section is inserted.

K	Number of bytes in DMT frame
R	Number of check bytes in RS code word
S	RS code word size in DMT frame
D	The interleaver depth
Delay	The delay in milliseconds (msec)

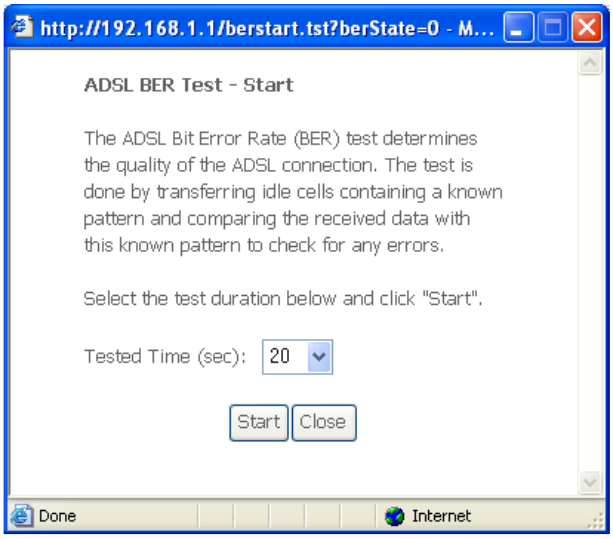
OH Frames	Total number of OH frames
OH Frame Errors	Number of OH frames received with errors
RS Words	Total number of Reed-Solomon code errors
RS Correctable Errors	Total Number of RS with correctable errors
RS Uncorrectable Errors	Total Number of RS words with uncorrectable errors

HEC Errors	Total Number of Header Error Checksum errors
OCD Errors	Total Number of Out-of-Cell Delineation errors
LCD Errors	Total number of Loss of Cell Delineation
Total Cells	Total number of ATM cells (including idle + data cells)
Data Cells	Total number of ATM data cells
Bit Errors	Total number of bit errors

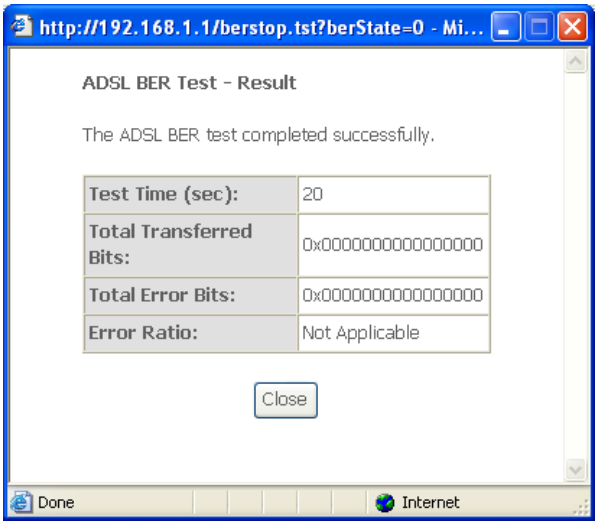
Total ES	Total Number of Errored Seconds
Total SES	Total Number of Severely Errored Seconds
Total UAS	Total Number of Unavailable Seconds

xDSL BER TEST

Click **xDSL BER Test** on the xDSL Statistics screen to test the Bit Error Rate (BER). A small pop-up window will open after the button is pressed, as shown below.

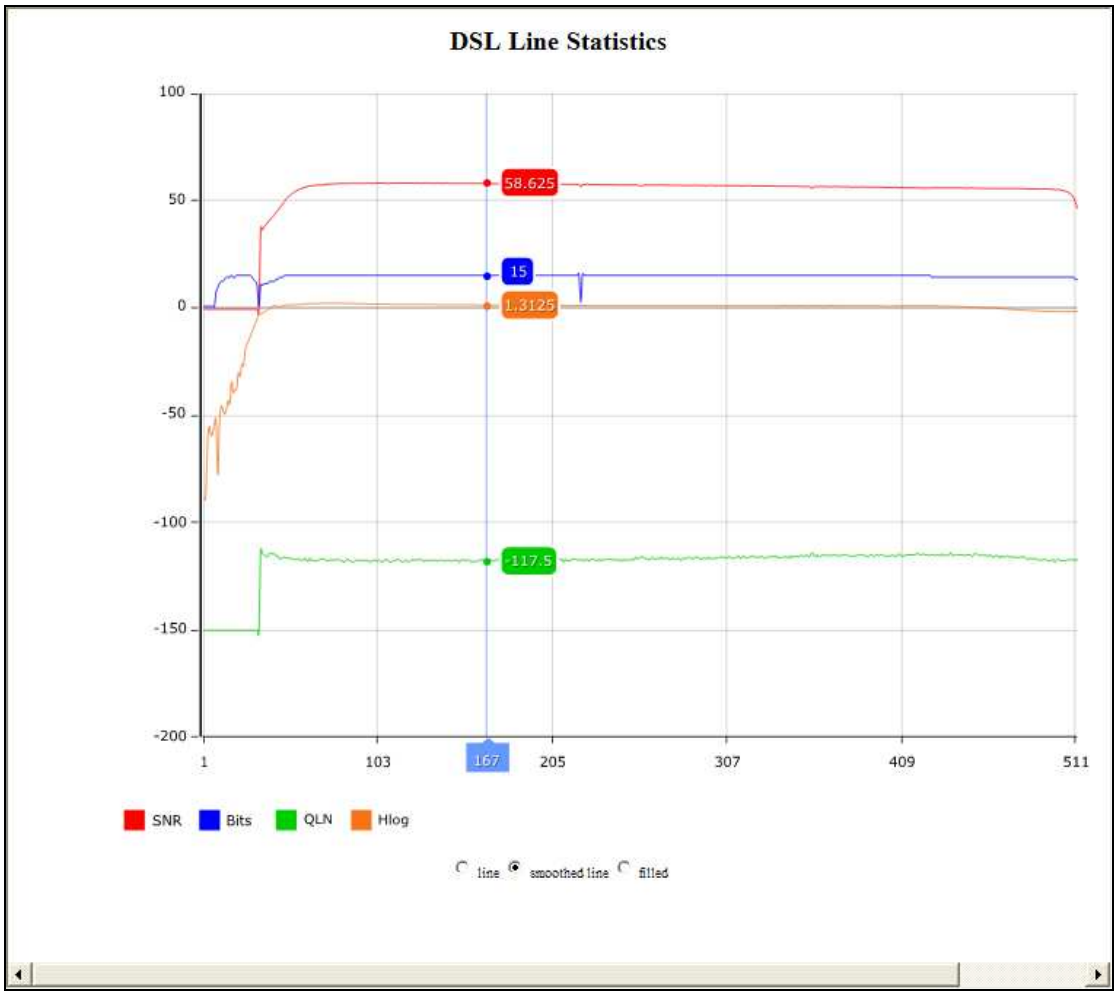

http://192.168.1.1/berstart.tst?berState=0 - M...
ADSL BER Test - Start
The ADSL Bit Error Rate (BER) test determines the quality of the ADSL connection. The test is done by transferring idle cells containing a known pattern and comparing the received data with this known pattern to check for any errors.
Select the test duration below and click "Start".
Tested Time (sec): 20
Start
Close
Done
Internet

Click **Start** to start the test or click **Close** to cancel the test. After the BER testing is complete, the pop-up window will display as follows.


http://192.168.1.1/berstop.tst?berState=0 - Mi...
ADSL BER Test - Result
The ADSL BER test completed successfully.
Test Time (sec): 20
Total Transferred Bits: 0x0000000000000000
Total Error Bits: 0x0000000000000000
Error Ratio: Not Applicable
Close
Done
Internet

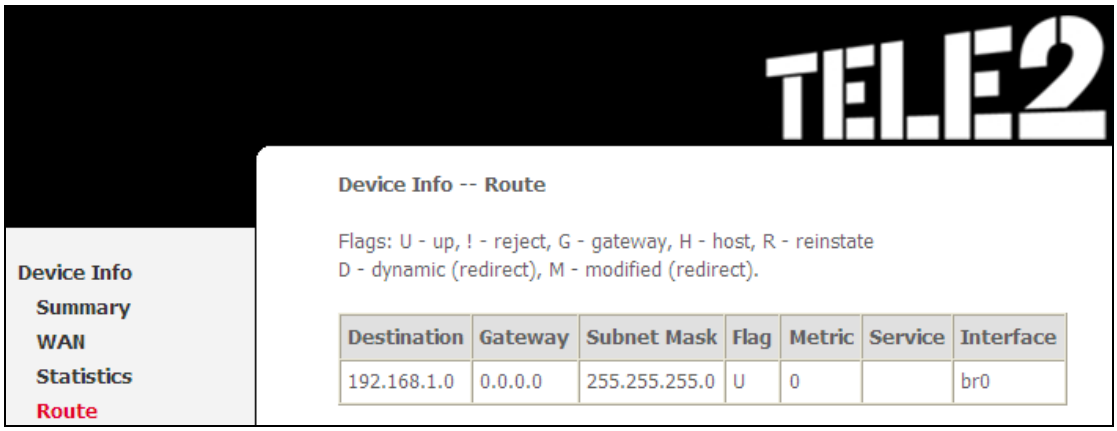
xDSL TONE GRAPH

Click **Draw Tone Graph** on the xDSL Statistics screen and a pop-up window will display the xDSL bits per tone status, as shown below.



4.3 Route

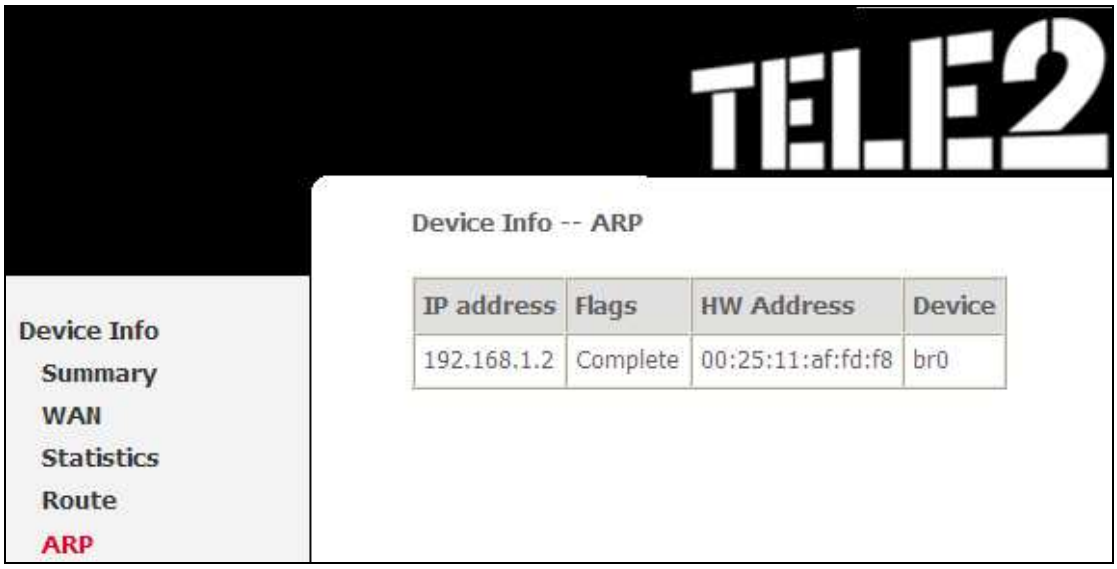
Choose **Route** to display the routes that the VI-3223u has found.



Field	Description
Destination	Destination network or destination host
Gateway	Next hub IP address
Subnet Mask	Subnet Mask of Destination
Flag	U: route is up !: reject route G: use gateway H: target is a host R: reinstate route for dynamic routing D: dynamically installed by daemon or redirect M: modified from routing daemon or redirect
Metric	The 'distance' to the target (usually counted in hops). It is not used by recent kernels, but may be needed by routing daemons.
Service	Shows the WAN connection label
Interface	Shows connection interfaces

4.4 ARP

Click **ARP** to display the ARP information.



Field	Description
IP address	Shows IP address of host pc
Flags	Complete, Incomplete, Permanent, or Publish
HW Address	Shows the MAC address of host pc
Device	Shows the connection interface

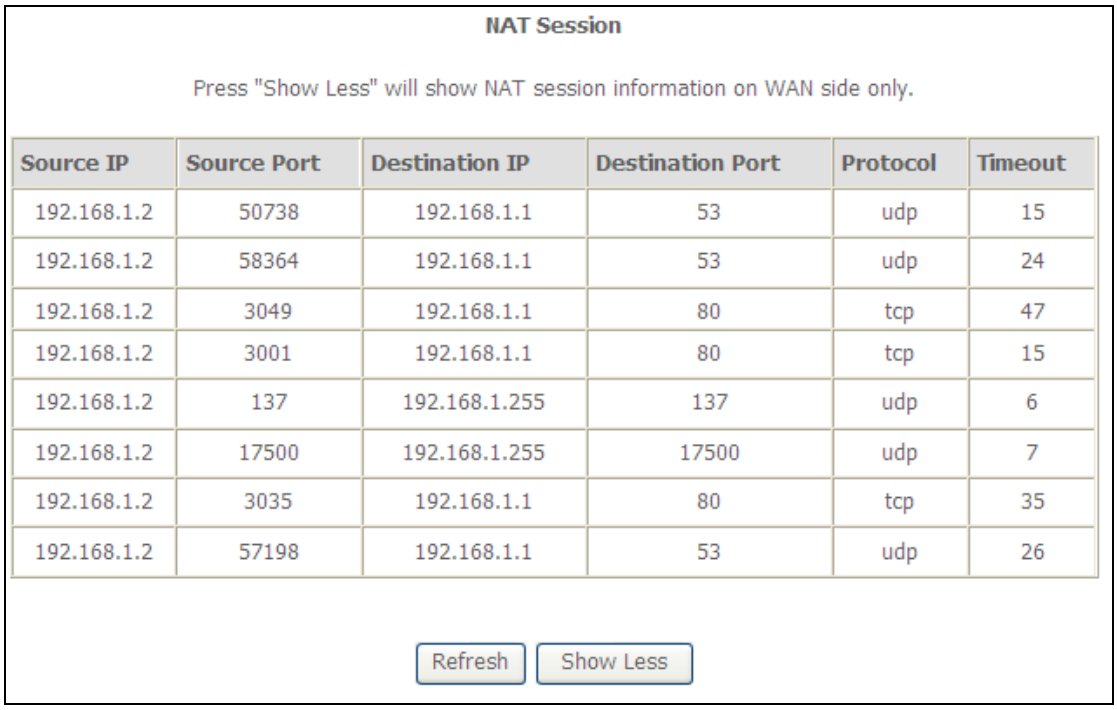
4.5 DHCP

Click **DHCP** to display all DHCP Leases.

Field	Description
Hostname	Shows the device/host/PC network name
MAC Address	Shows the Ethernet MAC address of the device/host/PC
IP Address	Shows IP address of device/host/PC
Expires In	Shows how much time is left for each DHCP Lease

4.6 NAT Session

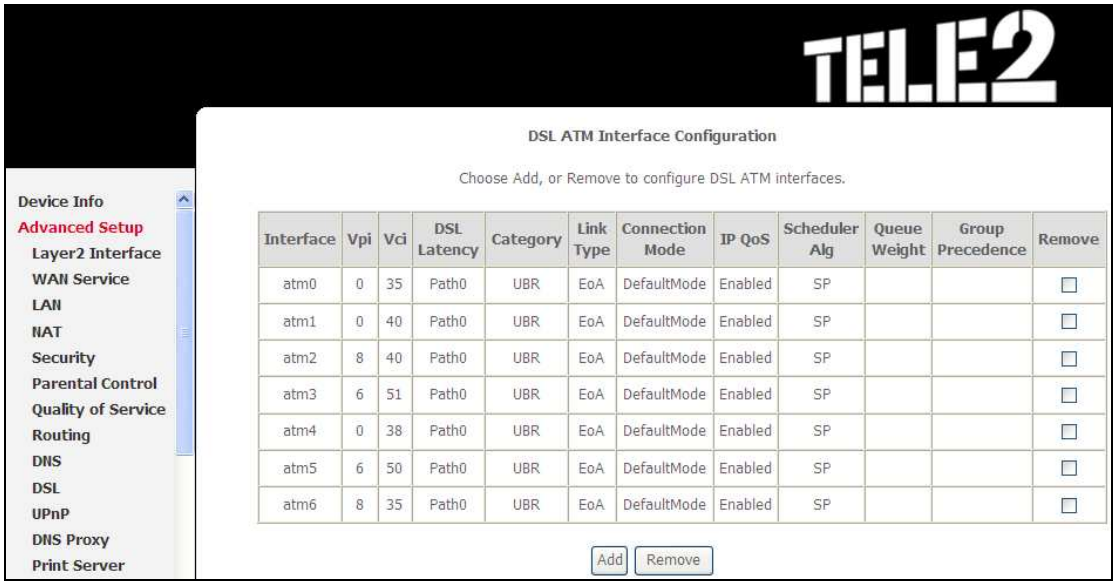
Click the "Show All" button to display the following.



Field	Description
Source IP	The source IP from which the NAT session is established
Source Port	The source port from which the NAT session is established
Destination IP	The IP which the NAT session was connected to
Destination Port	The port which the NAT session was connected to
Protocol	The Protocol used in establishing the particular NAT session
Timeout	The time remaining for the TCP/UDP connection to be active

Chapter 5 Advanced Setup

The following screen shows the advanced menu options.

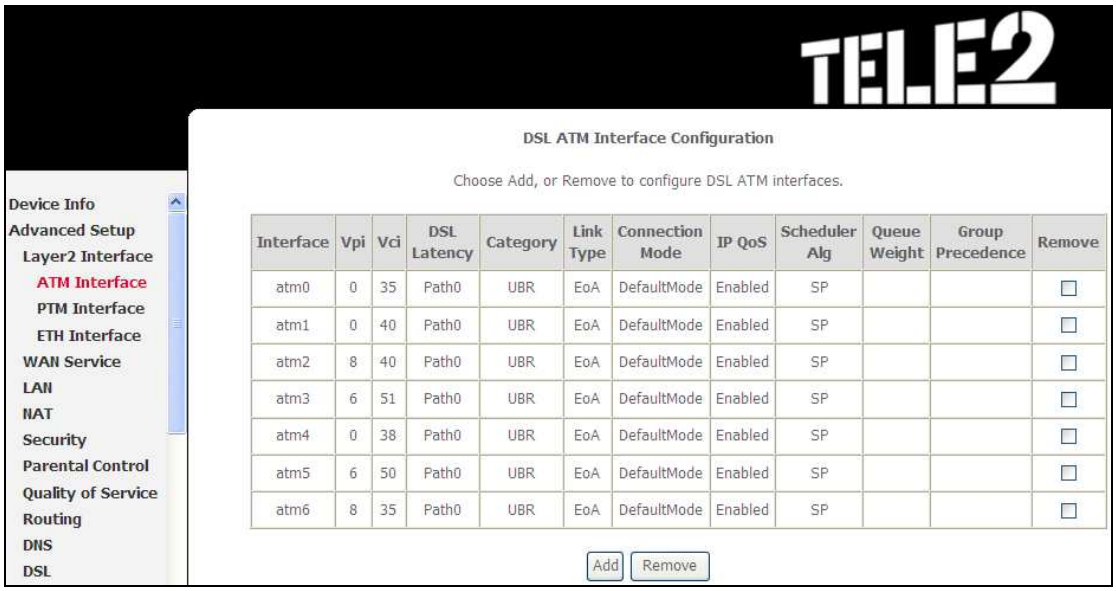

TELE2
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Routing
DNS
DSL
UPnP
DNS Proxy
Print Server
DSL ATM Interface Configuration
Choose Add, or Remove to configure DSL ATM interfaces.
Interface Vpi Vci DSL Latency Category Link Type Connection Mode IP QoS Scheduler Alg Queue Weight Group Precedence Remove
atm0 0 35 Path0 UBR EoA DefaultMode Enabled SP
atm1 0 40 Path0 UBR EoA DefaultMode Enabled SP
atm2 8 40 Path0 UBR EoA DefaultMode Enabled SP
atm3 6 51 Path0 UBR EoA DefaultMode Enabled SP
atm4 0 38 Path0 UBR EoA DefaultMode Enabled SP
atm5 6 50 Path0 UBR EoA DefaultMode Enabled SP
atm6 8 35 Path0 UBR EoA DefaultMode Enabled SP
Add
Remove

5.1 Layer 2 Interface

The ATM interface screen is described here.

5.1.1 ATM Interface

Add or remove ATM interface connections here.


TELE2
Device Info
Advanced Setup
Layer2 Interface
ATM Interface
PTM Interface
ETH Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Routing
DNS
DSL
DSL ATM Interface Configuration
Choose Add, or Remove to configure DSL ATM interfaces.
Interface | Vpi | Vci | DSL Latency | Category | Link Type | Connection Mode | IP QoS | Scheduler Alg | Queue Weight | Group Precedence | Remove
atm0 | 0 | 35 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
atm1 | 0 | 40 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
atm2 | 8 | 40 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
atm3 | 6 | 51 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
atm4 | 0 | 38 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
atm5 | 6 | 50 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
atm6 | 8 | 35 | Path0 | UBR | EoA | DefaultMode | Enabled | SP
Add
Remove

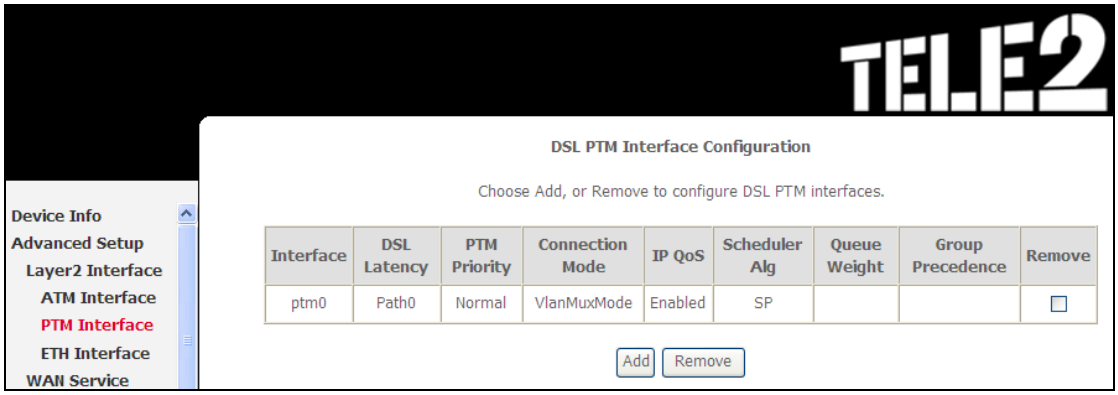
Click **Add** to create a new ATM interface (see Appendix G - Connection Setup).

NOTE:	Up to 8 ATM interfaces can be created and saved in flash memory.

To remove a connection, select its Remove column radio button and click **Remove**.

5.1.2 PTM Interface

Add or remove PTM interface connections here.

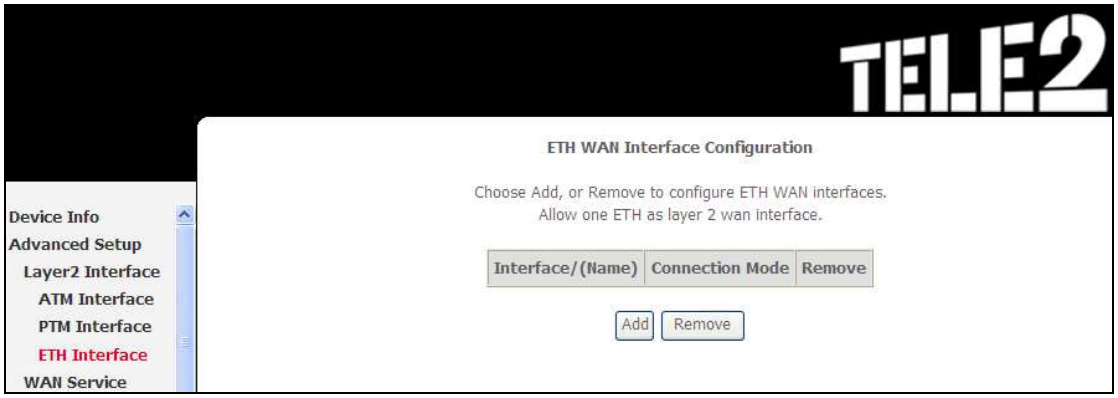


Click **Add** to create a new connection (see Appendix G - Connection Setup). To remove a connection, select its Remove column radio button and click **Remove**.

5.1.3 ETH Interface

This screen displays the Ethernet WAN Interface configuration.

NOTE:	This option only applies to models with an Ethernet WAN port.



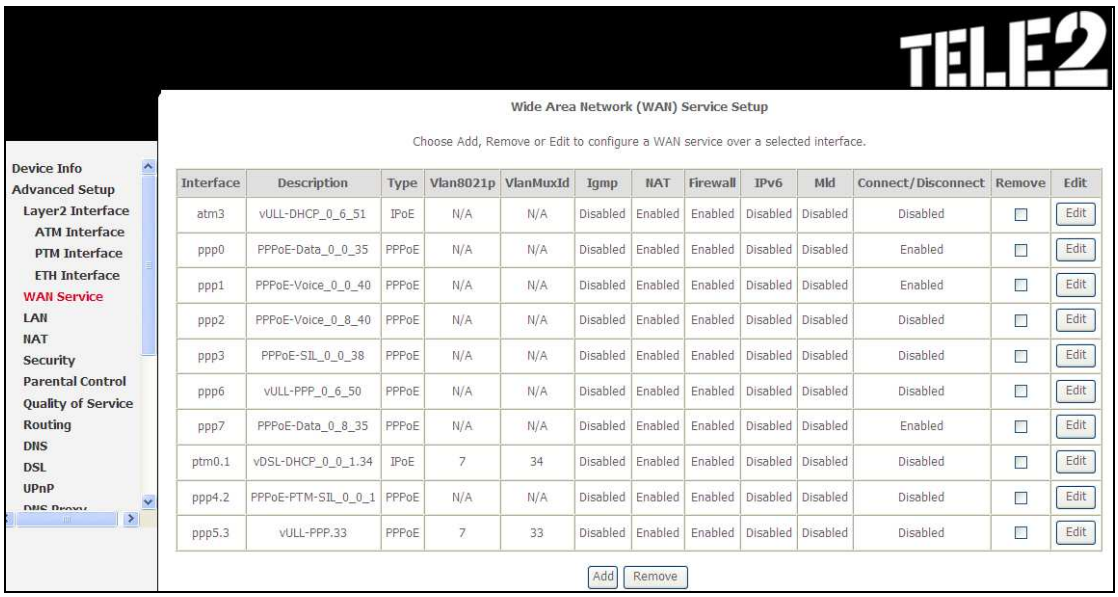
Click **Add** to create a new connection (see Appendix G).

NOTE:	One Ethernet WAN interface can be created and saved in flash memory.

To remove a connection, select its Remove column radio button and click **remove.**

5.2 WAN Service

This screen allows for the configuration of WAN interfaces.


TELE2
Wide Area Network (WAN) Service Setup
Choose Add, Remove or Edit to configure a WAN service over a selected interface.
Device Info
Advanced Setup
Layer2 Interface
ATM Interface
PTM Interface
ETH Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Routing
DNS
DSL
UPnP
Interface | Description | Type | Vlan8021p | VlanMuxId | Igmp | NAT | Firewall | IPv6 | Mld | Connect/Disconnect | Remove | Edit
atm3 | vULL-DHCP_0_6_51 | IPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
ppp0 | PPPoE-Data_0_0_35 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Enabled | Edit
ppp1 | PPPoE-Voice_0_0_40 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Enabled | Edit
ppp2 | PPPoE-Voice_0_8_40 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
ppp3 | PPPoE-SIL_0_0_38 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
ppp6 | vULL-PPP_0_6_50 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
ppp7 | PPPoE-Data_0_8_35 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Enabled | Edit
ptm0.1 | vDSL-DHCP_0_0_1.34 | IPoE | 7 | 34 | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
ppp4.2 | PPPoE-PTM-SIL_0_0_1 | PPPoE | N/A | N/A | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
ppp5.3 | vULL-PPP.33 | PPPoE | 7 | 33 | Disabled | Enabled | Enabled | Disabled | Disabled | Disabled | Edit
Add
Remove

Click the **Add** button to create a new connection. For connections on ATM or PTM WAN interfaces see Appendix G - Connection SetupAppendix G - Connection Setup.

NOTE:	ATM and PTM service connections cannot coexist. In Default Mode, up to 8 WAN connections can be configured; while VLAN Mux and MSC Connection Modes support up to 16 WAN connections.

To remove a connection, select its Remove column radio button and click **Remove.**

Heading	Description
Interface	Name of the interface for WAN
Description	Name of the WAN connection
Type	Shows the connection type
Vlan8021p	VLAN ID is used for VLAN Tagging (IEEE 802.1Q)
VlanMuxId	Shows 802.1Q VLAN ID
IGMP	Shows Internet Group Management Protocol (IGMP) status
NAT	Shows Network Address Translation (NAT) status
Firewall	Shows the Security status
Connect/Disconnect	Shows the WAN connection status
Remove	Select interfaces to remove
Edit	Select interfaces to edit

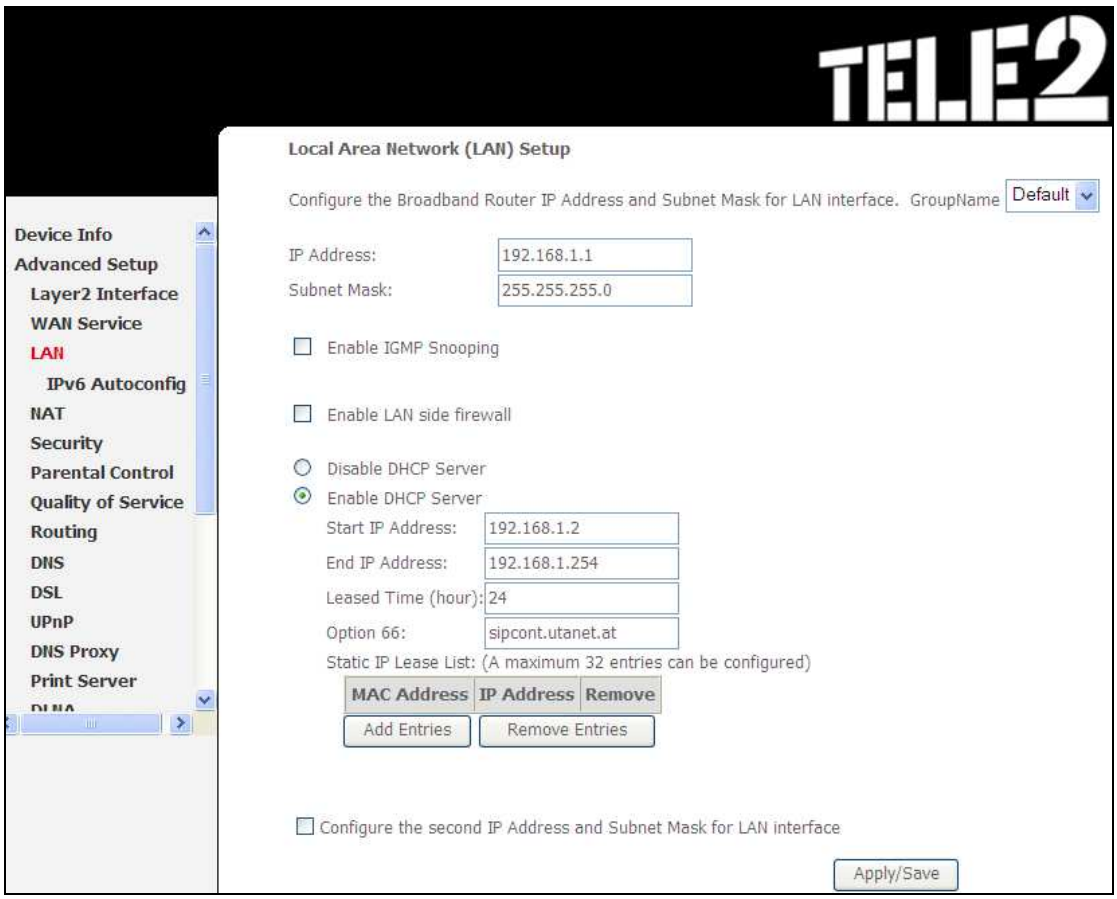
To remove a connection, select its Remove column radio button and click **Remove.**

To **Add** a new WAN connection, click the **Add** button and follow the instructions.

NOTE:	Up to 16 PVC profiles can be configured and saved in flash memory. Also, ATM and PTM service connections cannot coexist.

5.3 LAN

Configure the LAN interface settings and then click **Apply/Save**.



Consult the field descriptions below for more details.

GroupName: Select an Interface Group.

1st LAN INTERFACE

IP Address: Enter the IP address for the LAN port.

Subnet Mask: Enter the subnet mask for the LAN port.

Enable IGMP Snooping: Enable by ticking the checkbox ☑.

Standard Mode: In standard mode, multicast traffic will flood to all bridge ports when no client subscribes to a multicast group – even if IGMP snooping is enabled.

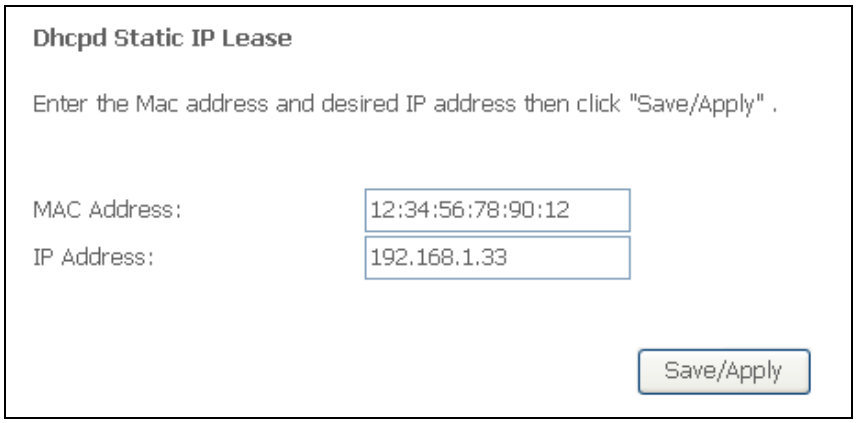
Blocking Mode: In blocking mode, the multicast data traffic will be blocked and not flood to all bridge ports when there are no client subscriptions to any multicast group.

Enable LAN side firewall: Enable by ticking the checkbox ☑.

DHCP Server: To enable DHCP, select **Enable DHCP server** and enter Start and End IP addresses and the Leased Time. This setting configures the router to automatically assign IP, default gateway and DNS server addresses to every PC on your LAN.

Static IP Lease List: A maximum of 32 entries can be configured.

To add an entry, enter MAC address and Static IP and then click **Save/Apply**.

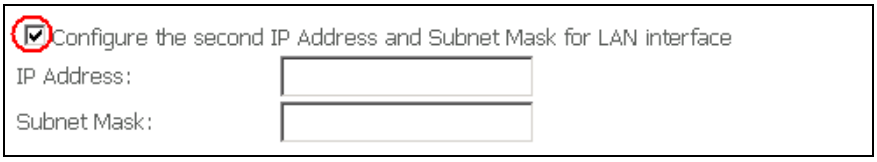


To remove an entry, tick the corresponding checkbox ☑ in the Remove column and then click the **Remove Entries** button, as shown below.

DHCP Server Relay: Enable with checkbox ☑ and enter DHCP Server IP address. This allows the Router to relay the DHCP packets to the remote DHCP server. The remote DHCP server will provide the IP address. ***This option is hidden if NAT is enabled or when the router is configured with only one Bridge PVC.***

2ND LAN INTERFACE

To configure a secondary IP address, tick the checkbox ☑ outlined (in RED) below.



IP Address: Enter the secondary IP address for the LAN port.

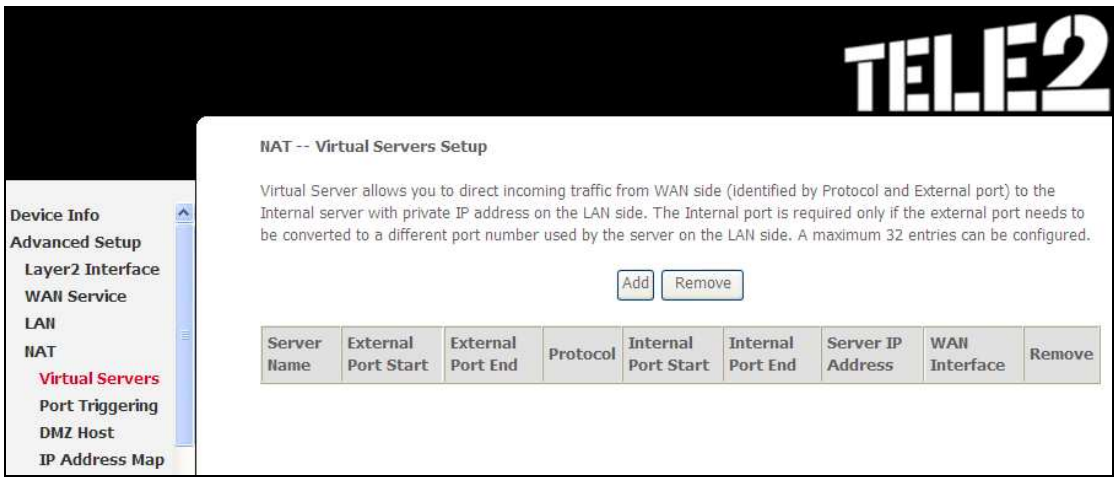
Subnet Mask: Enter the secondary subnet mask for the LAN port.

5.4 NAT

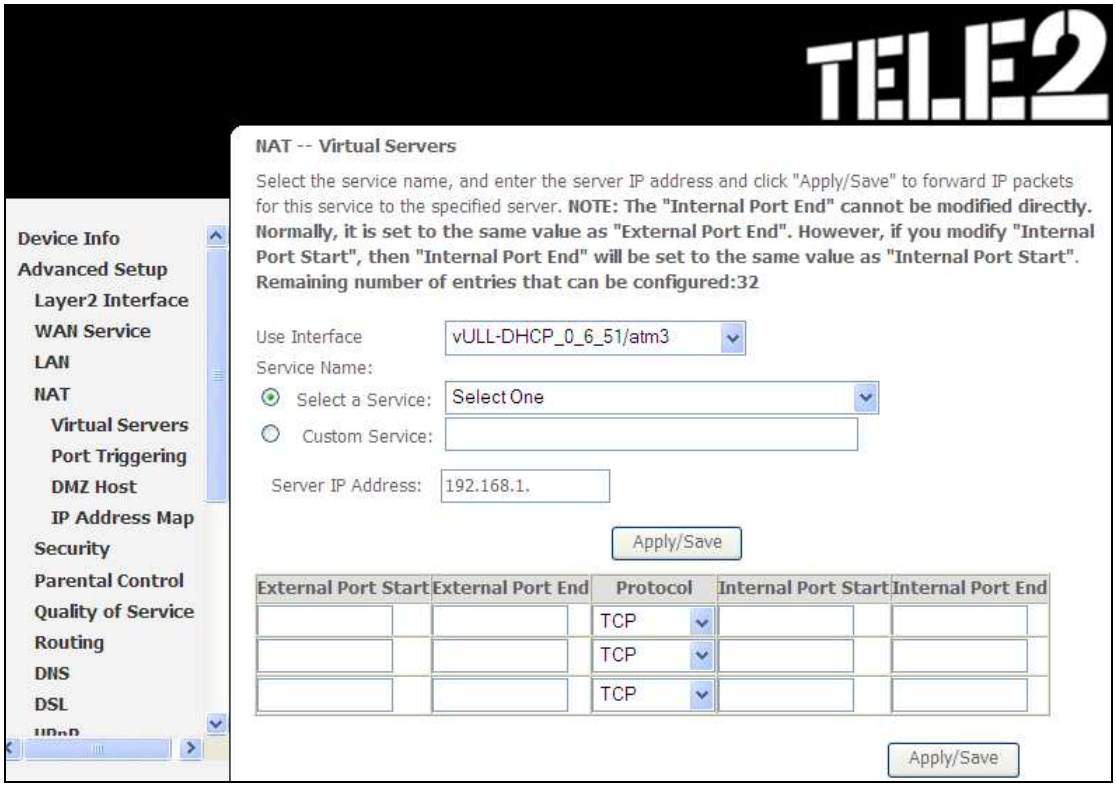
To display this option, NAT must be enabled in at least one PVC shown on the Chapter 5 Advanced Setup - . *NAT is not an available option in Bridge mode*.

5.4.1 Virtual Servers

Virtual Servers allow you to direct incoming traffic from the WAN side (identified by Protocol and External port) to the Internal server with private IP addresses on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side.
A maximum of 32 entries can be configured.


TELE2
NAT -- Virtual Servers Setup
Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured.
Add
Remove
Server Name
External Port Start
External Port End
Protocol
Internal Port Start
Internal Port End
Server IP Address
WAN Interface
Remove
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Virtual Servers
Port Triggering
DMZ Host
IP Address Map

To add a Virtual Server, click **Add**. The following will be displayed.

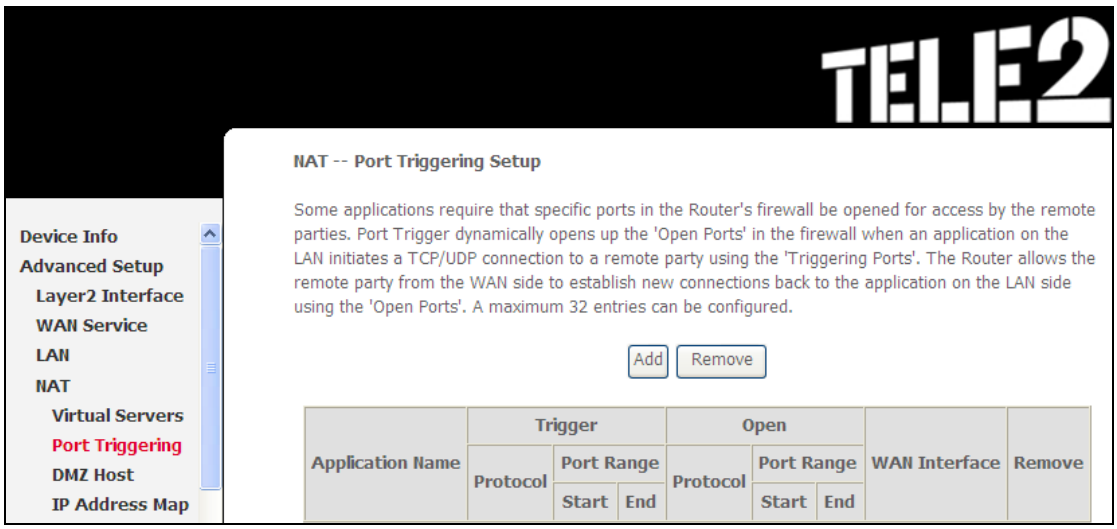


Consult the table below for field and header descriptions.

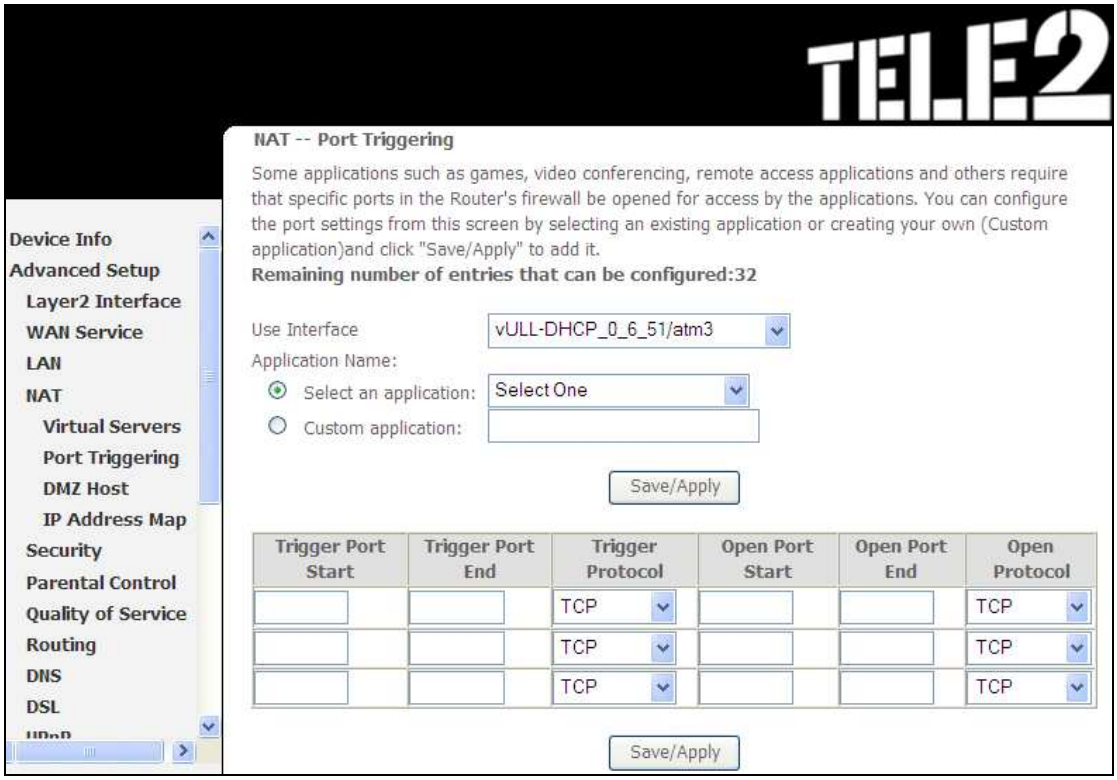
Field/Header	Description
Use Interface	Select a WAN interface from the drop-down box.
Select a Service **Or** Custom Service	User should select the service from the list. **Or** User can enter the name of their choice.
Server IP Address	Enter the IP address for the server.
External Port Start	Enter the starting external port number (when you select Custom Server). When a service is selected, the port ranges are automatically configured.
External Port End	Enter the ending external port number (when you select Custom Server). When a service is selected, the port ranges are automatically configured.
Protocol	TCP, TCP/UDP, or UDP.
Internal Port Start	Enter the internal port starting number (when you select Custom Server). When a service is selected the port ranges are automatically configured
Internal Port End	Enter the internal port ending number (when you select Custom Server). When a service is selected, the port ranges are automatically configured.

5.4.2 Port Triggering

Some applications require that specific ports in the firewall be opened for access by the remote parties. Port Triggers dynamically 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Triggering Ports'. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. A maximum 32 entries can be configured.


TELE2
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Virtual Servers
Port Triggering
DMZ Host
IP Address Map
NAT -- Port Triggering Setup
Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Triggering Ports'. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. A maximum 32 entries can be configured.
Add
Remove
Application Name
Trigger
Protocol
Port Range
Start
End
Open
Protocol
Port Range
Start
End
WAN Interface
Remove

To add a Trigger Port, click **Add**. The following will be displayed.

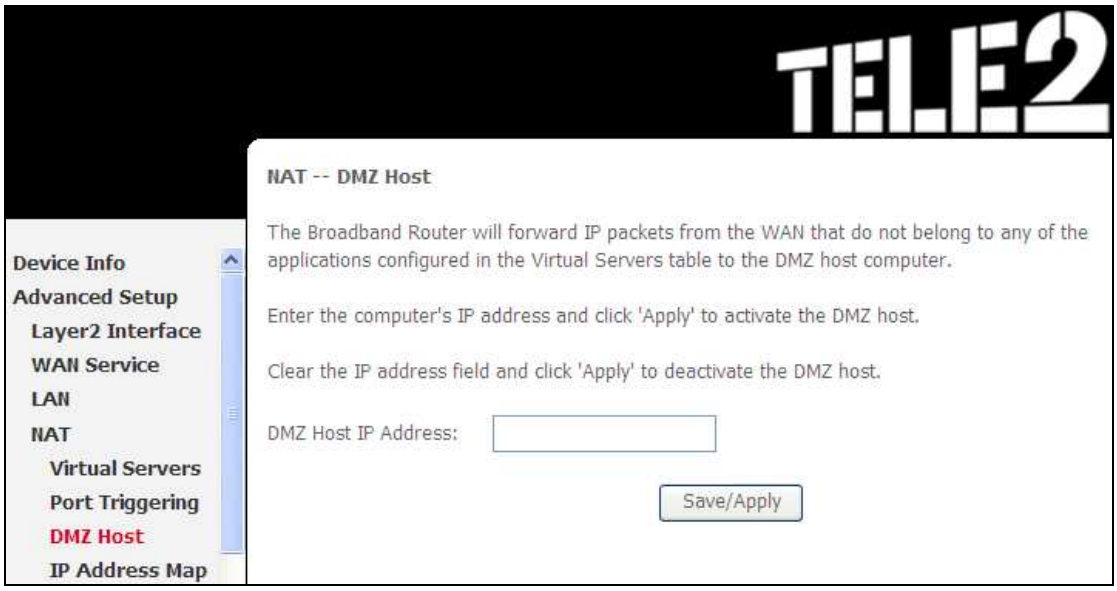


Consult the table below for field and header descriptions.

Field/Header	Description
Use Interface	Select a WAN interface from the drop-down box.
Select an Application **Or** Custom Application	User should select the application from the list. **Or** User can enter the name of their choice.
Trigger Port Start	Enter the starting trigger port number (when you select custom application). When an application is selected, the port ranges are automatically configured.
Trigger Port End	Enter the ending trigger port number (when you select custom application). When an application is selected, the port ranges are automatically configured.
Trigger Protocol	TCP, TCP/UDP, or UDP.
Open Port Start	Enter the starting open port number (when you select custom application). When an application is selected, the port ranges are automatically configured.
Open Port End	Enter the ending open port number (when you select custom application). When an application is selected, the port ranges are automatically configured.
Open Protocol	TCP, TCP/UDP, or UDP.

5.4.3 DMZ Host

The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.


TELE2
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Virtual Servers
Port Triggering
DMZ Host
IP Address Map
NAT -- DMZ Host
The Broadband Router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.
Enter the computer's IP address and click 'Apply' to activate the DMZ host.
Clear the IP address field and click 'Apply' to deactivate the DMZ host.
DMZ Host IP Address:
Save/Apply

To **Activate** the DMZ host, enter the DMZ host IP address and click **Save/Apply**.

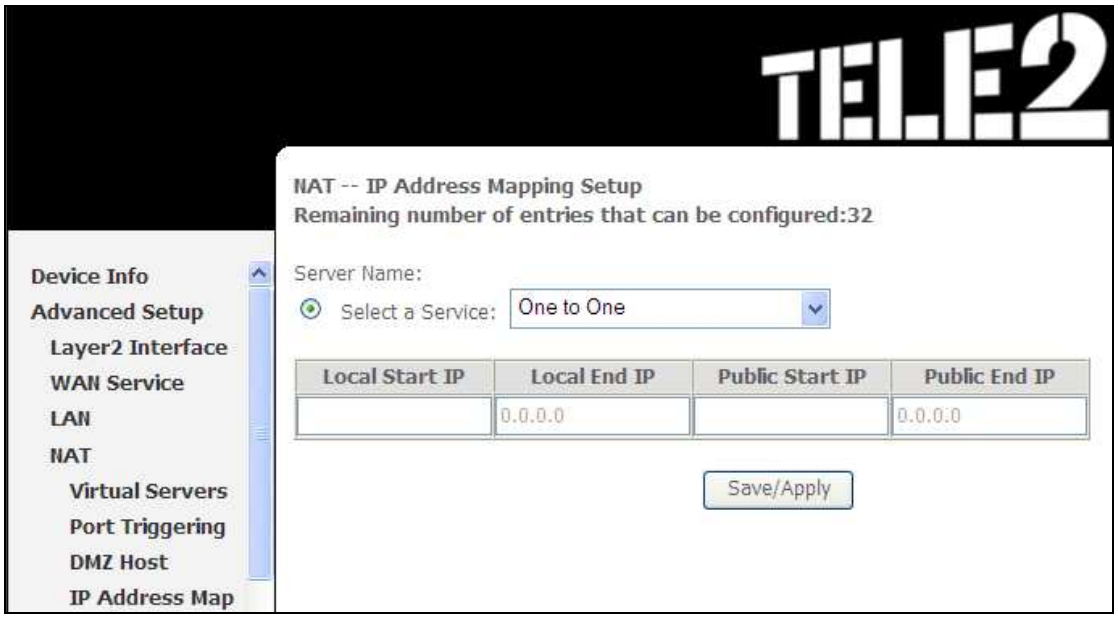
To **Deactivate** the DMZ host, clear the IP address field and click **Save/Apply**.

5.4.4 IP Address Map

Mapping Local IP (LAN IP) to some specified Public IP (WAN IP). It allows you to forward all requests directed to public IP addresses provided by ISP through the IAD's NAT interfaces. Once configured, all traffics to those public IP addresses will be forwarded to a specific host or server behind this IAD.

Field/Header	Description
Rule	The number of the rule
Type	Mapping type from local to public.
Local Start IP	The beginning of the local IP
Local End IP	The ending of the local IP
Public Start IP	The beginning of the public IP
Public End IP	The ending of the public IP
Remove	Remove this rule

Click **Add** to display the following.



Select a Service, then click the **Save/Apply** button.

One to One: mapping one local IP to a specific public IP

Many to One: mapping a range of local IP to a specific public IP

Many to Many(Overload): mapping a range of local IP to a different range of public IP

Many to Many(No Overload): mapping a range of local IP to a same range of public IP

5.5 Security

To display this function, you must enable the firewall feature in WAN Setup.
For detailed descriptions, with examples, please consult Appendix A - Firewall

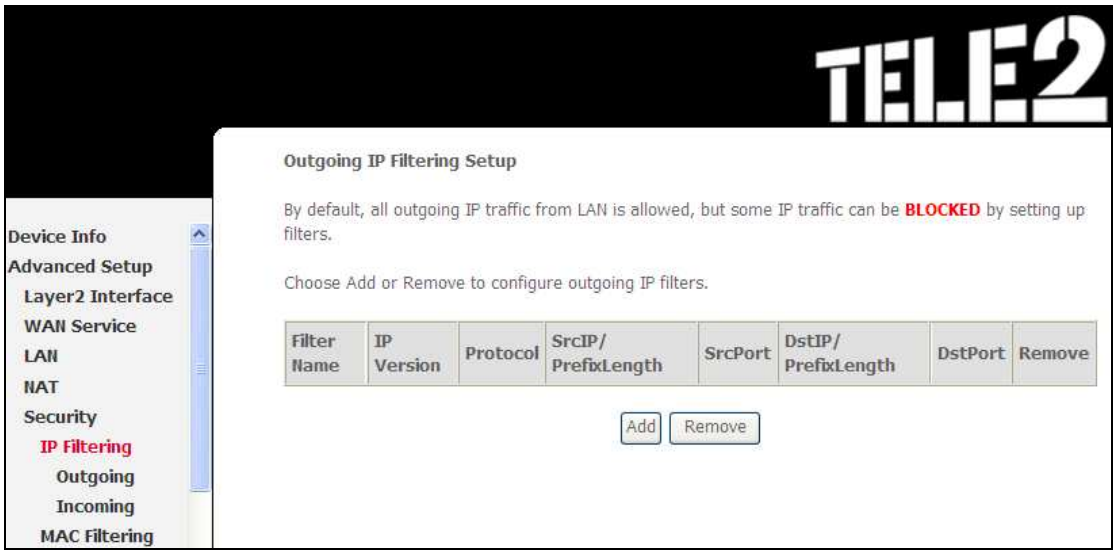
5.5.1 IP Filtering

This screen sets filter rules that limit IP traffic (Outgoing/Incoming). Multiple filter rules can be set and each applies at least one limiting condition. For individual IP packets to pass the filter all conditions must be fulfilled.

NOTE:	This function is not available when in bridge mode. Instead, 5.5.2 MAC Filtering performs a similar function.

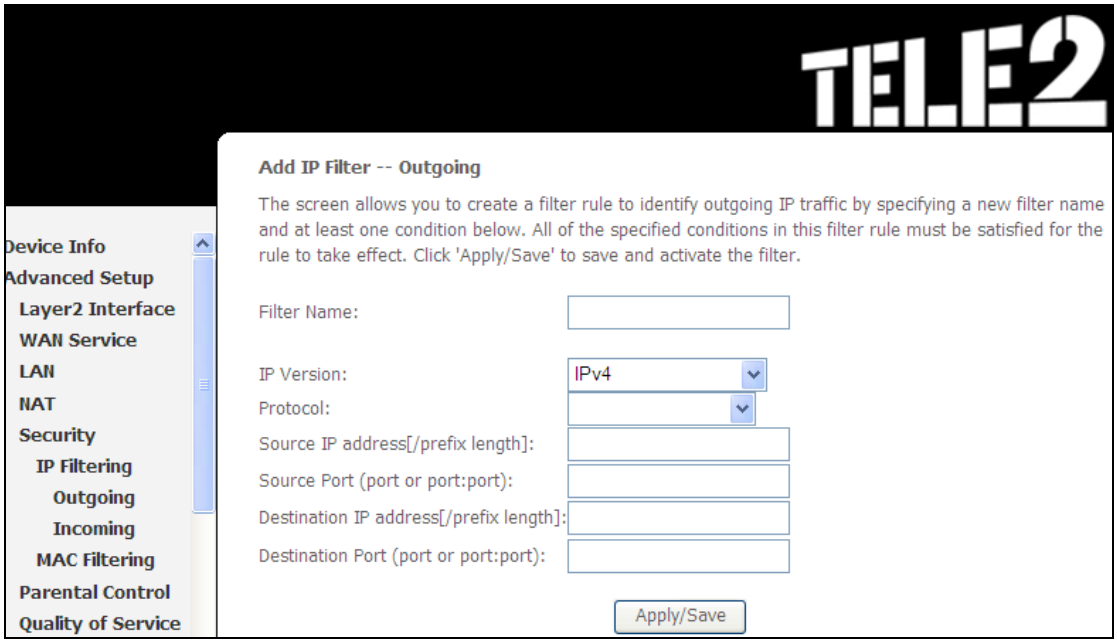
OUTGOING IP FILTER

By default, all outgoing IP traffic is allowed, but IP traffic can be blocked with filters.



To add a filter (to block some outgoing IP traffic), click the **Add** button.

On the following screen, enter your filter criteria and then click **Apply/Save**.

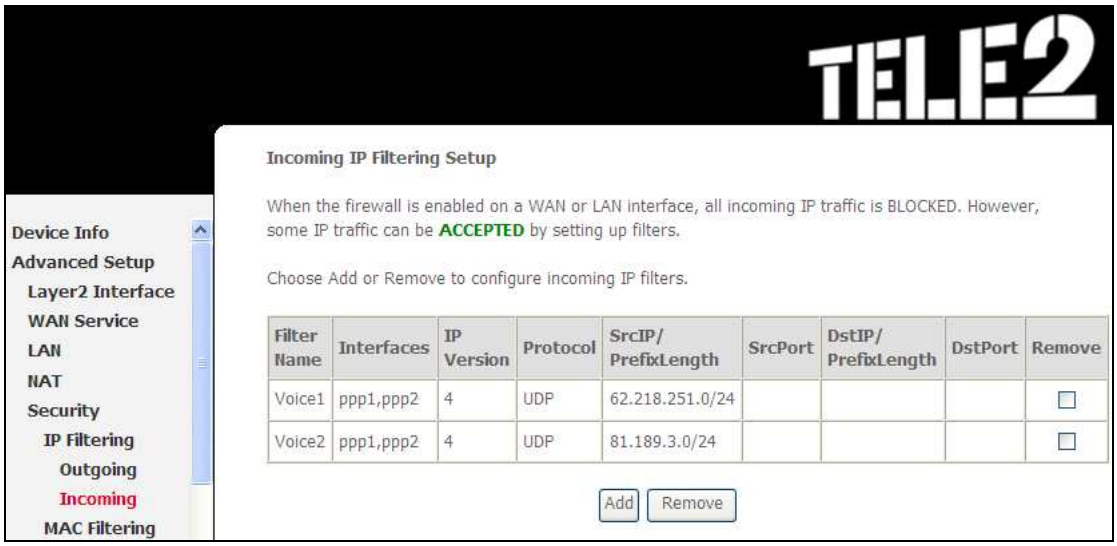

Add IP Filter -- Outgoing
The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click 'Apply/Save' to save and activate the filter.
Filter Name:
IP Version:
IPv4
Protocol:
Source IP address[/prefix length]:
Source Port (port or port:port):
Destination IP address[/prefix length]:
Destination Port (port or port:port):
Apply/Save
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
IP Filtering
Outgoing
Incoming
MAC Filtering
Parental Control
Quality of Service

Consult the table below for field descriptions.

Field	Description
Filter Name	The filter rule label.
IP Version	IPv4 selected by default.
Protocol	TCP, TCP/UDP, UDP, or ICMP.
Source IP address	Enter source IP address.
Source Port (port or port:port)	Enter source port number or range.
Destination IP address	Enter destination IP address.
Destination Port (port or port:port)	Enter destination port number or range.

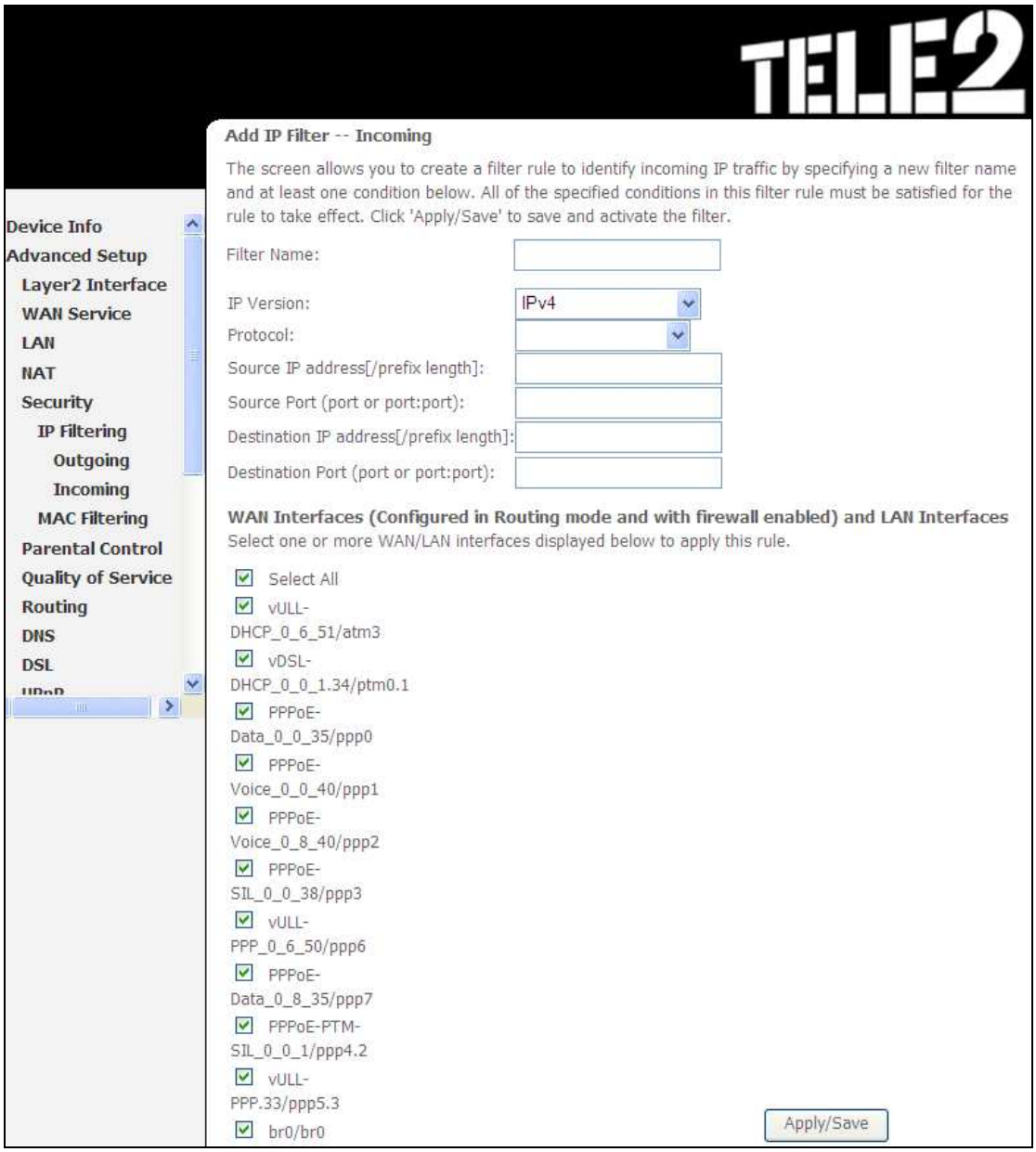
INCOMING IP FILTER

By default, all incoming IP traffic is blocked, but IP traffic can be allowed with filters.



To add a filter (to allow incoming IP traffic), click the **Add** button.

On the following screen, enter your filter criteria and then click **Apply/Save**.



Consult the table below for field descriptions.

Field	Description
Filter Name	The filter rule label
IP Version	IPv4 selected by default.
Protocol	TCP, TCP/UDP, UDP, or ICMP.
Source IP address	Enter source IP address.
Source Port (port or port:port)	Enter source port number or range.
Destination IP address	Enter destination IP address.
Destination Port (port or port:port)	Enter destination port number or range.

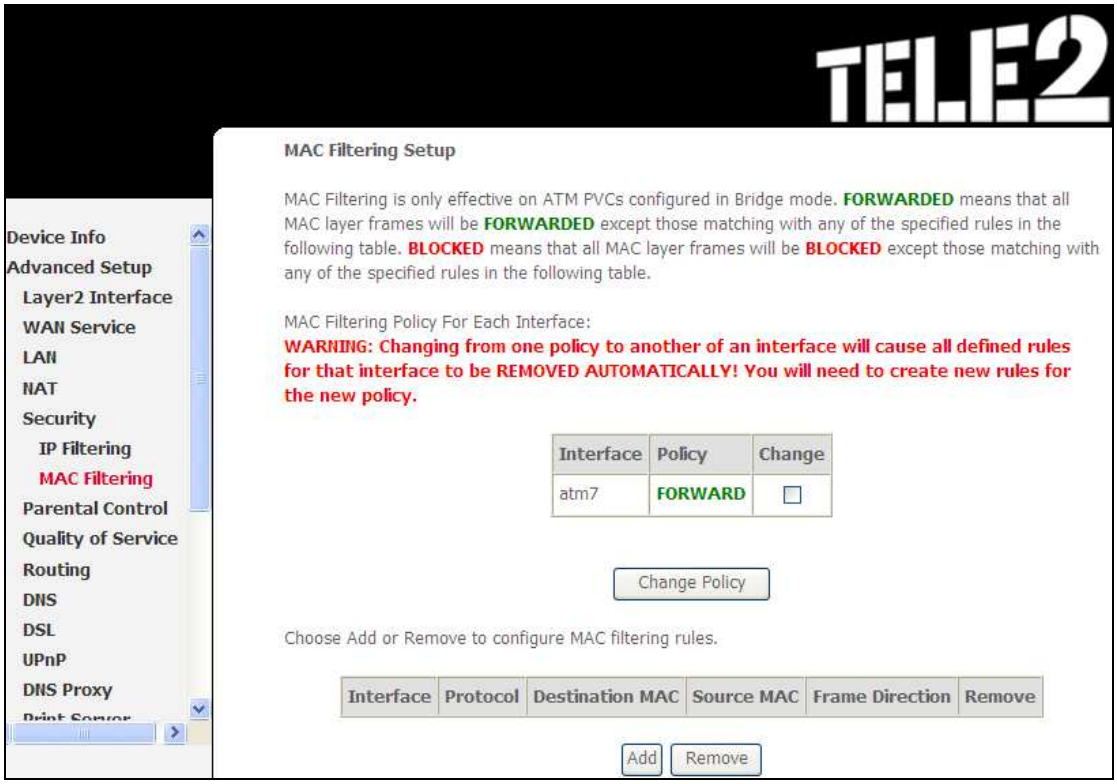
At the bottom of this screen, select the WAN and LAN Interfaces to which the filter rule will apply. You may select all or just a subset. WAN interfaces in bridge mode or without firewall enabled are not available.

5.5.2 MAC Filtering

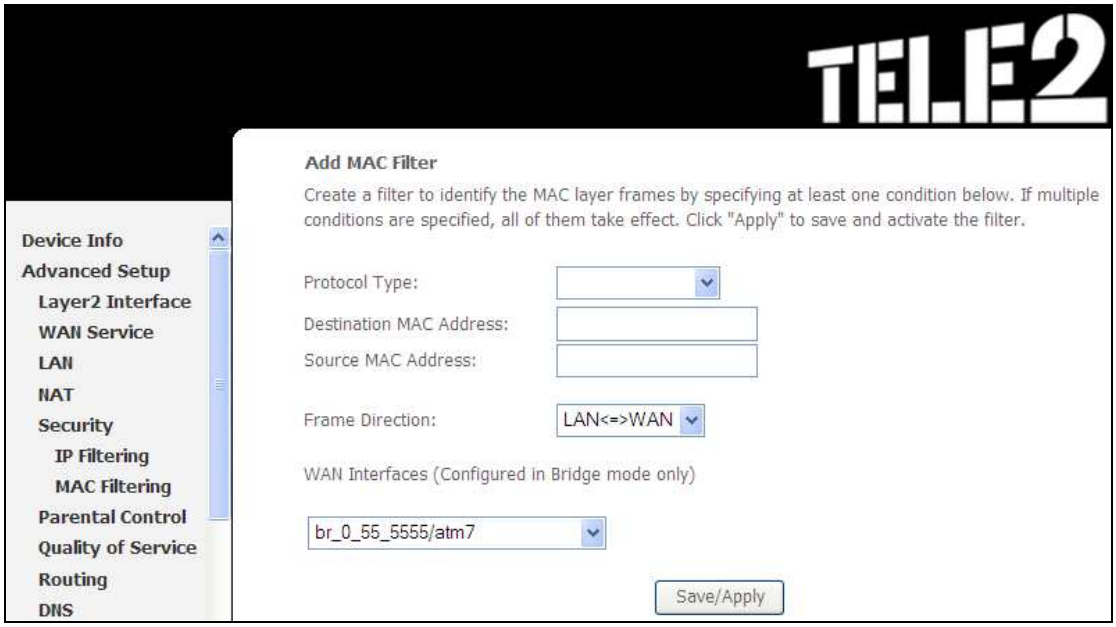
NOTE:	This option is only available in bridge mode. Other modes use 5.5.1 IP Filtering to perform a similar function.

Each network device has a unique 48-bit MAC address. This can be used to filter (block or forward) packets based on the originating device. MAC filtering policy and rules for the VI-3223u can be set according to the following procedure.

The MAC Filtering Global Policy is defined as follows. **FORWARDED** means that all MAC layer frames will be **FORWARDED** except those matching the MAC filter rules. **BLOCKED** means that all MAC layer frames will be **BLOCKED** except those matching the MAC filter rules. The default MAC Filtering Global policy is **FORWARDED**. It can be changed by clicking the **Change Policy** button.


TELE2
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
IP Filtering
MAC Filtering
Parental Control
Quality of Service
Routing
DNS
DSL
UPnP
DNS Proxy
MAC Filtering Setup
MAC Filtering is only effective on ATM PVCs configured in Bridge mode. FORWARDED means that all MAC layer frames will be FORWARDED except those matching with any of the specified rules in the following table. BLOCKED means that all MAC layer frames will be BLOCKED except those matching with any of the specified rules in the following table.
MAC Filtering Policy For Each Interface:
WARNING: Changing from one policy to another of an interface will cause all defined rules for that interface to be REMOVED AUTOMATICALLY! You will need to create new rules for the new policy.
Interface
Policy
Change
atm7
FORWARD
Change Policy
Choose Add or Remove to configure MAC filtering rules.
Interface
Protocol
Destination MAC
Source MAC
Frame Direction
Remove
Add
Remove

Choose **Add** or **Remove** to configure MAC filtering rules. The following screen will appear when you click **Add**. Create a filter to identify the MAC layer frames by specifying at least one condition below. If multiple conditions are specified, all of them must be met. Click **Save/Apply** to save and activate the filter rule.



Consult the table below for detailed field descriptions.

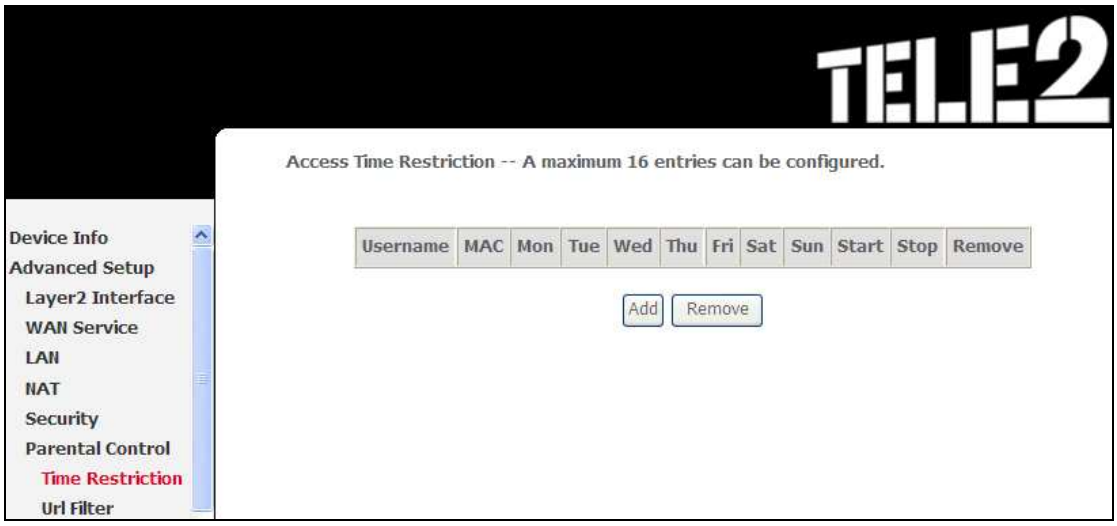
Field	Description
Protocol Type	PPPoE, IPv4, IPv6, AppleTalk, IPX, NetBEUI, IGMP
Destination MAC Address	Defines the destination MAC address
Source MAC Address	Defines the source MAC address
Frame Direction	Select the incoming/outgoing packet interface
WAN Interfaces	Applies the filter to the selected bridge interface.

5.6 Parental Control

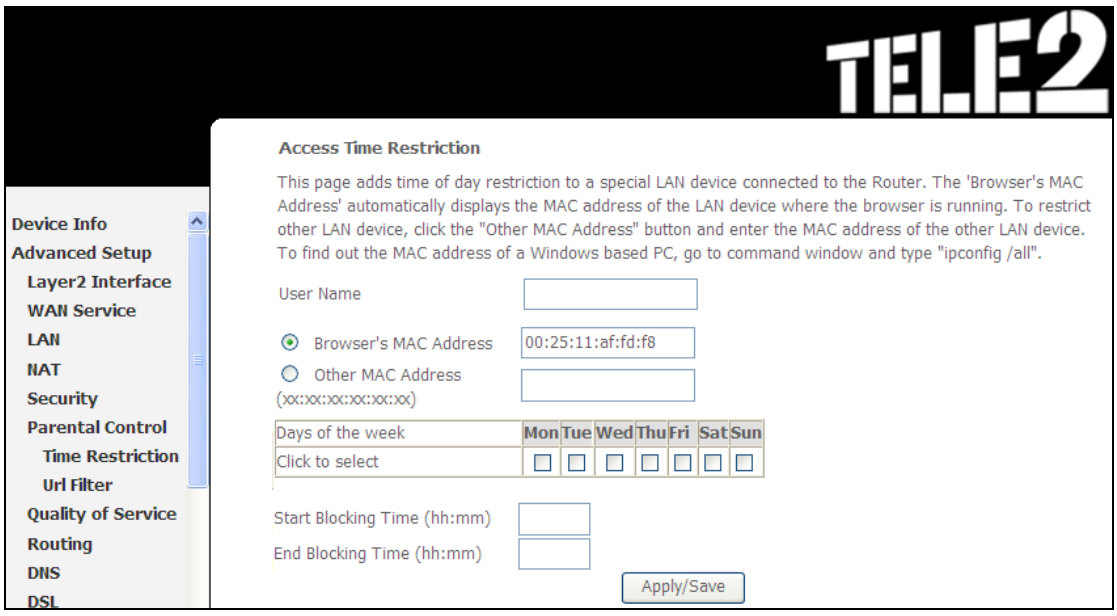
This selection provides WAN access control functionality.

5.6.1 Time Restriction

This feature restricts access from a LAN device to an outside network through the device on selected days at certain times. Make sure to activate the Internet Time server synchronization as described in 9.5 Internet Time, so that the scheduled times match your local time.



Click **Add** to display the following screen.

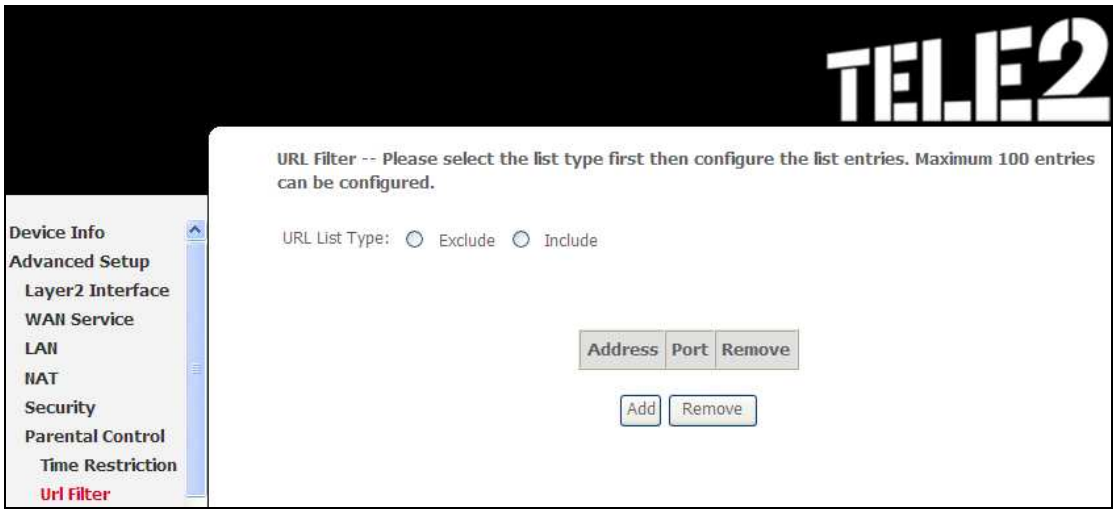

Access Time Restriction
This page adds time of day restriction to a special LAN device connected to the Router. The 'Browser's MAC Address' automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click the "Other MAC Address" button and enter the MAC address of the other LAN device. To find out the MAC address of a Windows based PC, go to command window and type "ipconfig /all".
User Name
Browser's MAC Address
00:25:11:af:fd:f8
Other MAC Address
(xx:xx:xx:xx:xx:xx)
Days of the week
Mon Tue Wed Thu Fri Sat Sun
Click to select
Start Blocking Time (hh:mm)
End Blocking Time (hh:mm)
Apply/Save
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Time Restriction
Url Filter
Quality of Service
Routing
DNS
DSL

See below for field descriptions. Click **Apply/Save** to add a time restriction.

User Name: A user-defined label for this restriction.
Browser's MAC Address: MAC address of the PC running the browser.
Other MAC Address: MAC address of another LAN device.
Days of the Week: The days the restrictions apply.
Start Blocking Time: The time the restrictions start.
End Blocking Time: The time the restrictions end.

5.6.2 URL Filter

This screen allows for the creation of a filter rule for access rights to websites based on their URL address and port number.



Tick the **Exclude** radio button to deny access to the websites listed.

Tick the **Include** radio button to restrict access to only those listed websites.

Click **Add** to display the following screen.

Parental Control -- URL Filter Add
Enter the URL address and port number then click "Apply/Save" to add the entry to the URL filter.
URL Address: www.yahoo.com
Port Number: 80
(Default 80 will be applied if leave blank.)
Apply/Save

Enter the URL address and port number then click **Apply**/**Save** to add the entry to the URL filter. URL Addresses begin with "www", as shown in this example.

URL Filter -- Please select the list type first then configure the list entries. Maximum 100 entries can be configured.
URL List Type: Exclude Include
Address Port Remove
www.yahoo.com 80
Add Remove

A maximum of 100 entries can be added to the URL Filter list.

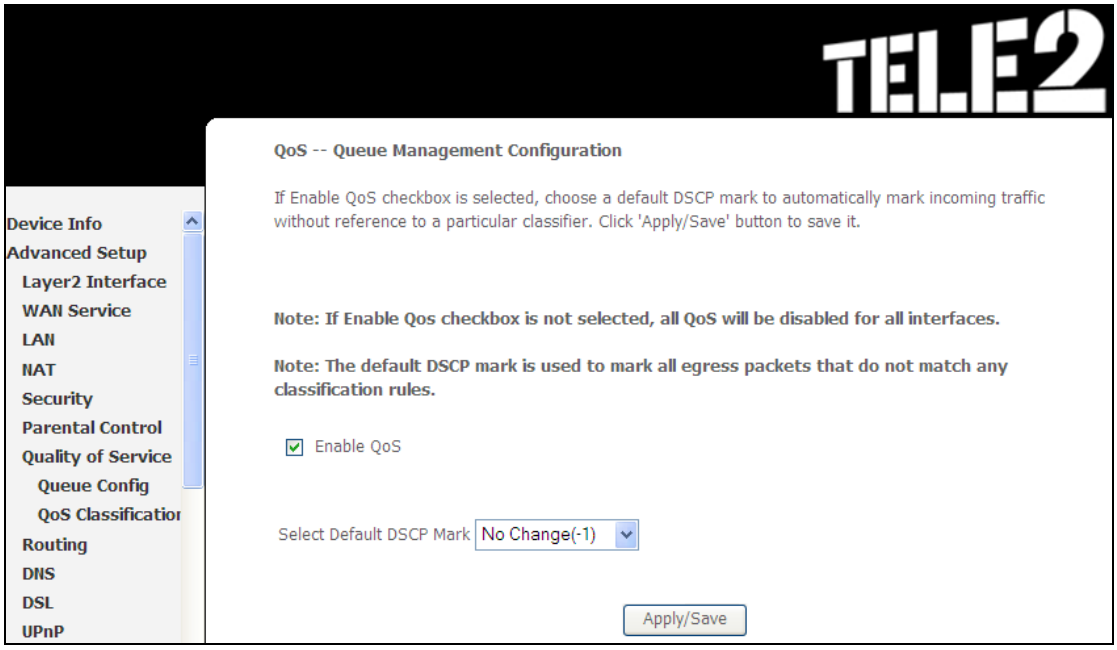
5.7 Quality of Service (QoS)

NOTE:	QoS must be enabled in at least one PVC to display this option. (See Appendix G - Connection SetupAppendix G - Connection Setup for detailed PVC setup instructions).

5.7.1 Queue Management Configuration

To Enable QoS tick the checkbox ☑ and select a Default DSCP Mark.

Click **Apply/Save** to activate QoS.


TELE2
QoS -- Queue Management Configuration
If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Apply/Save' button to save it.
Note: If Enable Qos checkbox is not selected, all QoS will be disabled for all interfaces.
Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules.
Enable QoS
Select Default DSCP Mark
No Change(-1)
Apply/Save
Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Queue Config
QoS Classificatior
Routing
DNS
DSL
UPnP

QoS and **DSCP Mark** are defined as follows:

Quality of Service (QoS): This provides different priority to different users or data flows, or guarantees a certain level of performance to a data flow in accordance with requests from Queue Prioritization.

Default Differentiated Services Code Point (DSCP) Mark: This specifies the per hop behavior for a given flow of packets in the Internet Protocol (IP) header that do not match any other QoS rule.

Select Default DSCP Mark:
The six most significant bits of the DiffServ field is called as the DSCP (Differentiated Services Code Point). The last two Currently Unused (CU) bits in the DiffServ field were not defined within the DiffServ field architecture; these are now used as Explicit Congestion Notification (ECN) bits. Routers at the edge of the network classify packets and mark them with either the IP Precedence or DSCP value in a Diffserv network. Other network devices in the core that support Diffserv use the DSCP value in the IP header to select a PHB behavior for the packet and provide the appropriate QoS treatment.

The diagrams in this section show a comparison between the ToS byte defined by RFC 791 and the DiffServ field.

ToS Byte
P2 P1 P0 T2 T1 T0 CU1 CU0

- IP precedence—three bits (P2 to P0)
- Delay, Throughput and Reliability—three bits (T2 to T0)
- CU (Currently Unused)—two bits(CU1-CU0)

DiffServ Field
DS5 DS4 DS3 DS2 DS1 DS0 ECN ECN

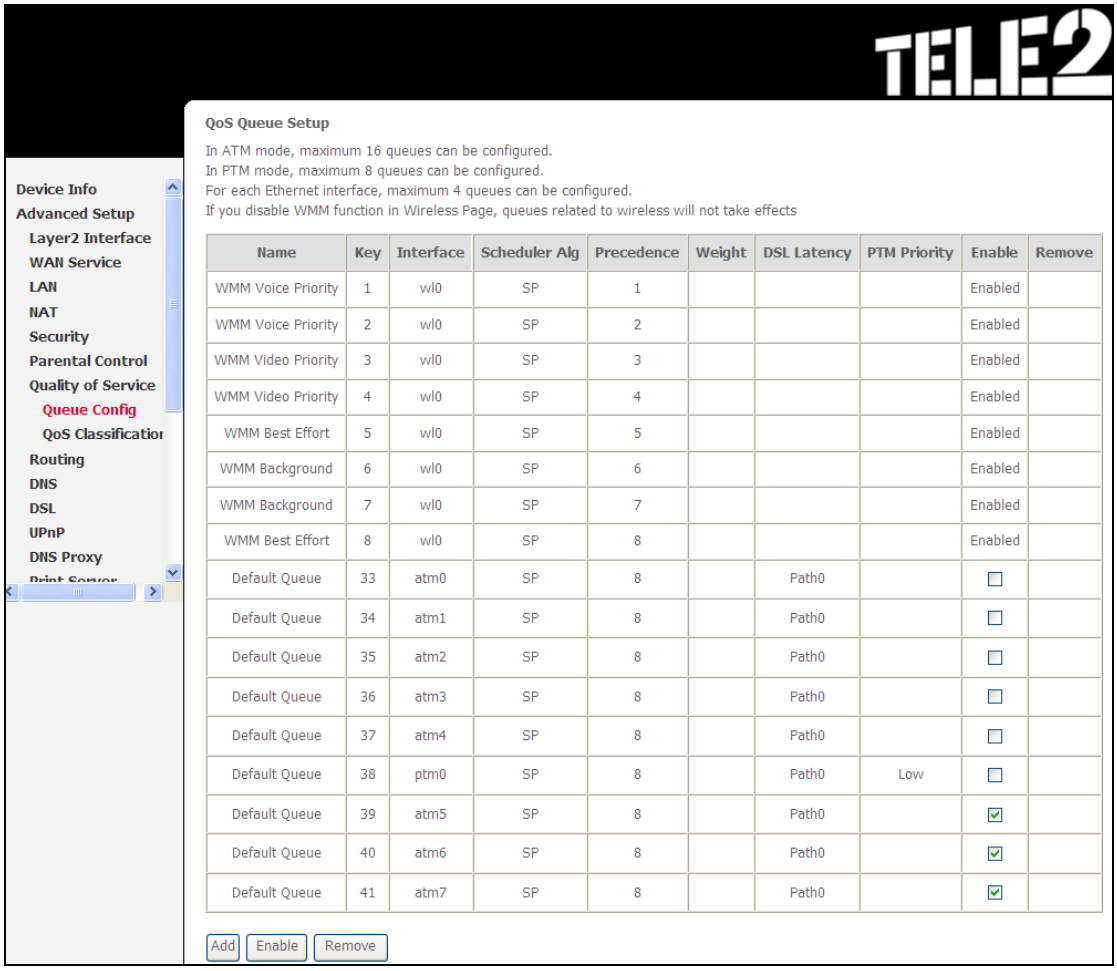
- DSCP—six bits (DS5-DS0)
- ECN—two bits

The standardized DiffServ field of the packet is marked with a value so that the packet receives a particular forwarding treatment or PHB, at each network node. The default DSCP is 000 000. Class selector DSCPs are values that are backward compatible with IP precedence. When converting between IP precedence and DSCP, match the three most significant bits. In other words:
IP Prec 5 (101) maps to IP DSCP 101 000
ToS Byte
1 0 1 T2 T1 T0 CU2 CU0

DiffServ Field
1 0 1 0 0 0 ECN ECN

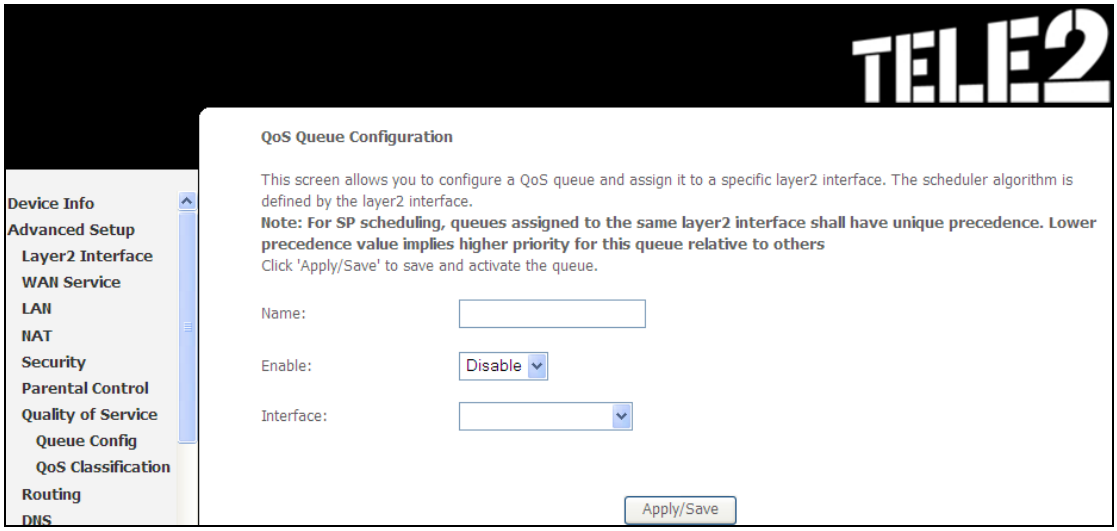
5.7.2 Queue Configuration

This function follows the Differentiated Services rule of IP QoS. You can create a new Queue entry by clicking the **Add** button. Enable and assign an interface and precedence on the next screen. Click **Save/Reboot** on this screen to activate it.



Name	Key	Interface	Scheduler Alg	Precedence	Weight	DSL Latency	PTM Priority	Enable	Remove
WMM Voice Priority	1	wl0	SP	1				Enabled	
WMM Voice Priority	2	wl0	SP	2				Enabled	
WMM Video Priority	3	wl0	SP	3				Enabled	
WMM Video Priority	4	wl0	SP	4				Enabled	
WMM Best Effort	5	wl0	SP	5				Enabled	
WMM Background	6	wl0	SP	6				Enabled	
WMM Background	7	wl0	SP	7				Enabled	
WMM Best Effort	8	wl0	SP	8				Enabled	
Default Queue	33	atm0	SP	8		Path0		☐	
Default Queue	34	atm1	SP	8		Path0		☐	
Default Queue	35	atm2	SP	8		Path0		☐	
Default Queue	36	atm3	SP	8		Path0		☐	
Default Queue	37	atm4	SP	8		Path0		☐	
Default Queue	38	ptm0	SP	8		Path0	Low	☐	
Default Queue	39	atm5	SP	8		Path0		☑	
Default Queue	40	atm6	SP	8		Path0		☑	
Default Queue	41	atm7	SP	8		Path0		☑	

Click **Enable** to activate the QoS Queue. Click **Add** to display the following screen.


Device Info
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Queue Config
QoS Classification
Routing
DNS
QoS Queue Configuration
This screen allows you to configure a QoS queue and assign it to a specific layer2 interface. The scheduler algorithm is defined by the layer2 interface.
Note: For SP scheduling, queues assigned to the same layer2 interface shall have unique precedence. Lower precedence value implies higher priority for this queue relative to others
Click 'Apply/Save' to save and activate the queue.
Name:
Enable:
Disable
Interface:
Apply/Save

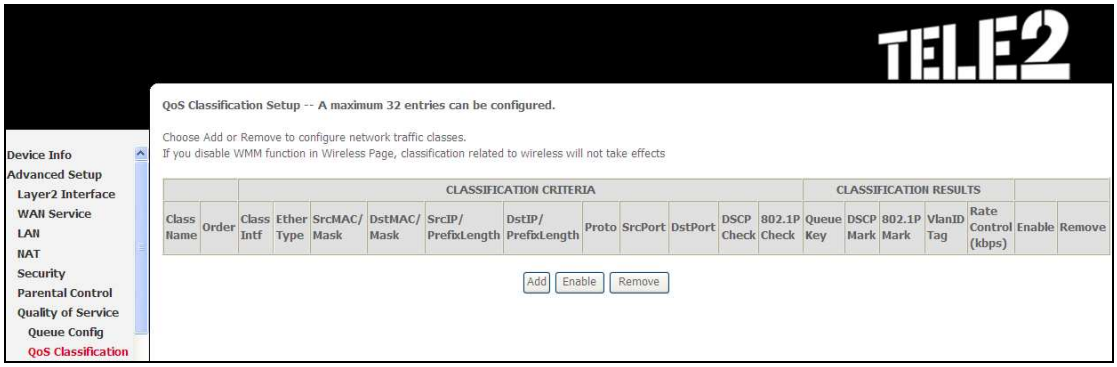
Name: Identifier for this Queue entry.

Enable: Enable/Disable the Queue entry.

Interface: Assign the entry to a specific network interface (QoS enabled).

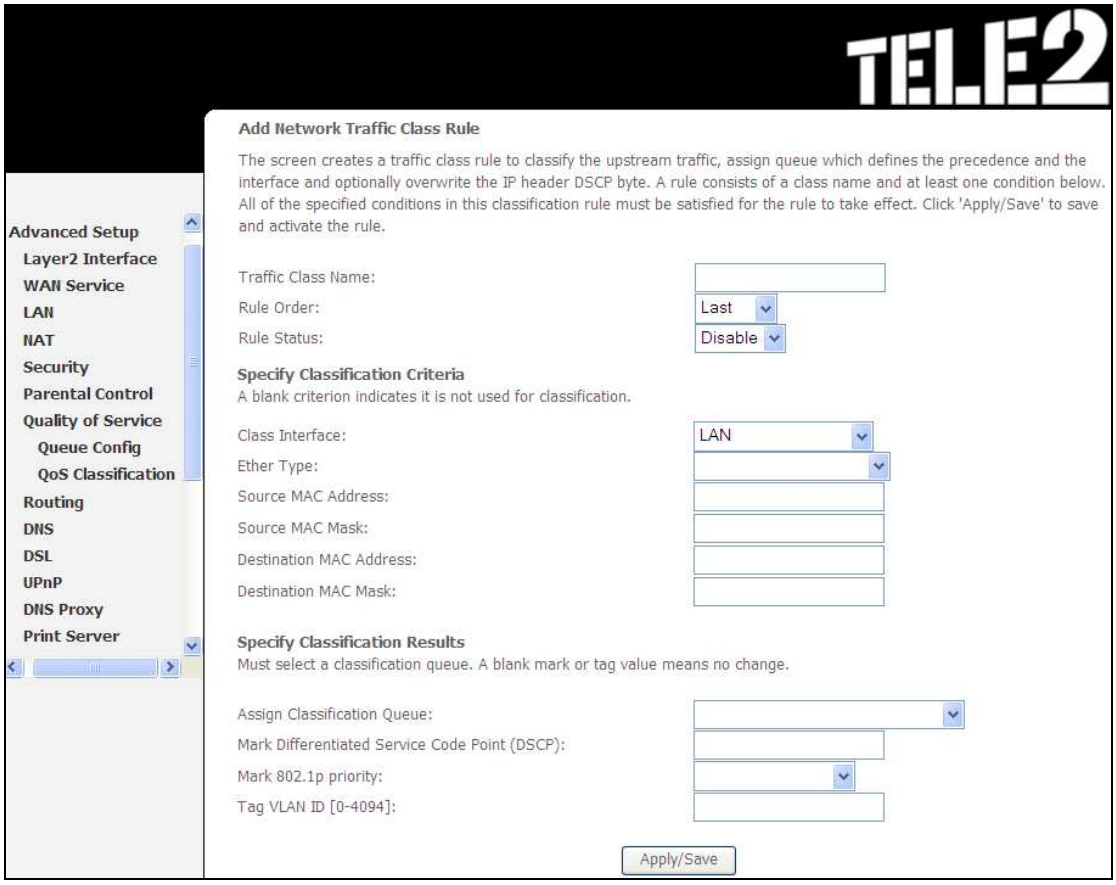
5.7.3 QoS Classification

The network traffic classes are listed in the following table.



Click **Add** to configure a network traffic class rule and **Enable** to activate it. To delete an entry from the list, click **Remove**.

This screen creates a traffic class rule to classify the upstream traffic, assign queuing priority and optionally overwrite the IP header DSCP byte. A rule consists of a class name and at least one logical condition. All the conditions specified in the rule must be satisfied for it to take effect.


Add Network Traffic Class Rule
The screen creates a traffic class rule to classify the upstream traffic, assign queue which defines the precedence and the interface and optionally overwrite the IP header DSCP byte. A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect. Click 'Apply/Save' to save and activate the rule.
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Queue Config
QoS Classification
Routing
DNS
DSL
UPnP
DNS Proxy
Print Server
Traffic Class Name:
Rule Order:
Last
Rule Status:
Disable
Specify Classification Criteria
A blank criterion indicates it is not used for classification.
Class Interface:
LAN
Ether Type:
Source MAC Address:
Source MAC Mask:
Destination MAC Address:
Destination MAC Mask:
Specify Classification Results
Must select a classification queue. A blank mark or tag value means no change.
Assign Classification Queue:
Mark Differentiated Service Code Point (DSCP):
Mark 802.1p priority:
Tag VLAN ID [0-4094]:
Apply/Save

Field	Description
Traffic Class Name	Enter a name for the traffic class.
Rule Order	Last is the only option.
Rule Status	Disable or enable the rule.
Classification Criteria	
Class Interface	Select an interface (i.e. Local, eth0-4, wl0)
Ether Type	Set the Ethernet type (e.g. IP, ARP, IPv6).
Source MAC Address	A packet belongs to SET-1, if a binary-AND of its source MAC address with the Source MAC Mask is equal to the binary-AND of the Source MAC Mask and this field.
Source MAC Mask	This is the mask used to decide how many bits are checked in Source MAC Address.
Destination MAC Address	A packet belongs to SET-1 then the result that the Destination MAC Address of its header binary-AND to the Destination MAC Mask must equal to the result that this field binary-AND to the Destination MAC Mask.
Destination MAC Mask	This is the mask used to decide how many bits are checked in Destination MAC Address.
Classification Results	
Assign Classification Queue	The queue configurations are presented in this format: "Interfacename&Prece P&Queue Q" where P and Q are the Precedence and Queue Key values for the corresponding Interface as listed on the Queue Config screen.
Mark Differentiated Service Code Point	The selected Code Point gives the corresponding priority to packets that satisfy the rule.
Mark 802.1p Priority	Select between 0-7. Lower values have higher priority.
Tag VLAN ID	Enter a 802.1Q VLAN ID tag [2-4094]

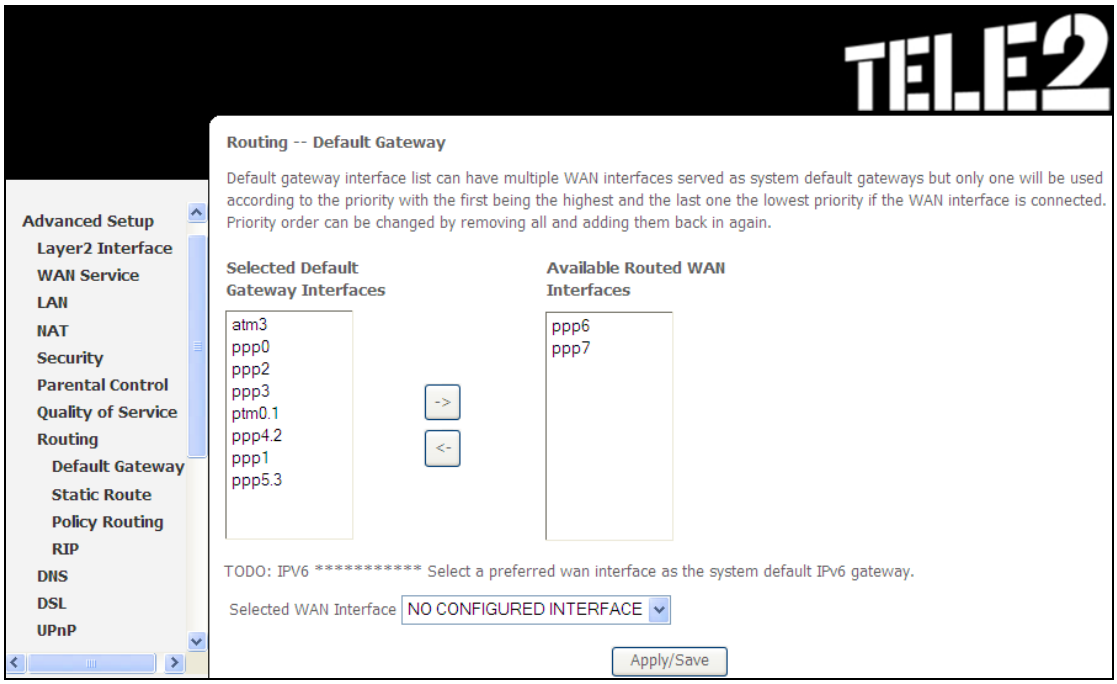
5.8 Routing

This following routing functions are accessed from this menu:
Default Gateway, Static Route, Policy Routing and **RIP**.

NOTE:	In bridge mode, the **RIP** menu option is hidden while the other menu options are shown but ineffective.

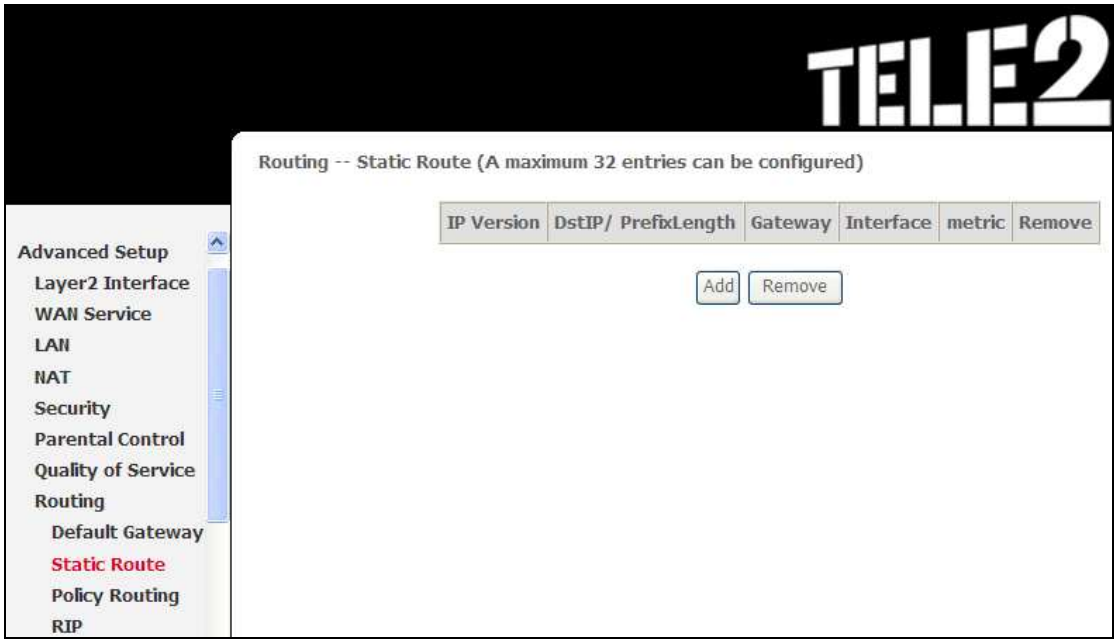
5.8.1 Default Gateway

Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.

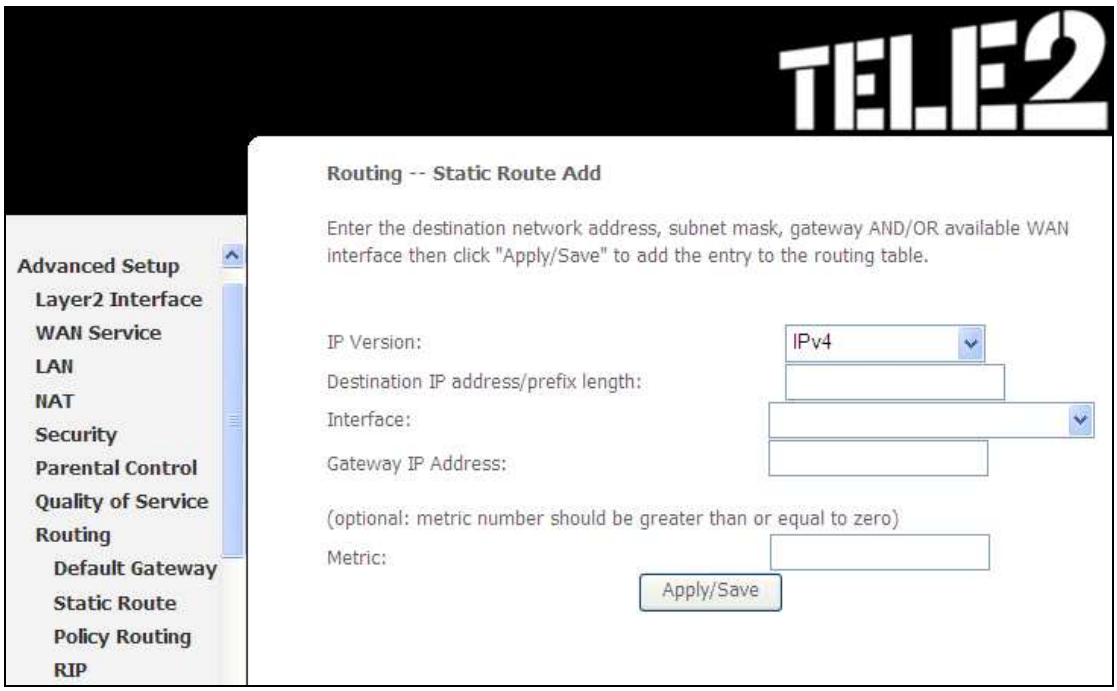


5.8.2 Static Route

This option allows for the configuration of static routes by destination IP.
Click **Add** to create a static route or click **Remove** to delete a static route.



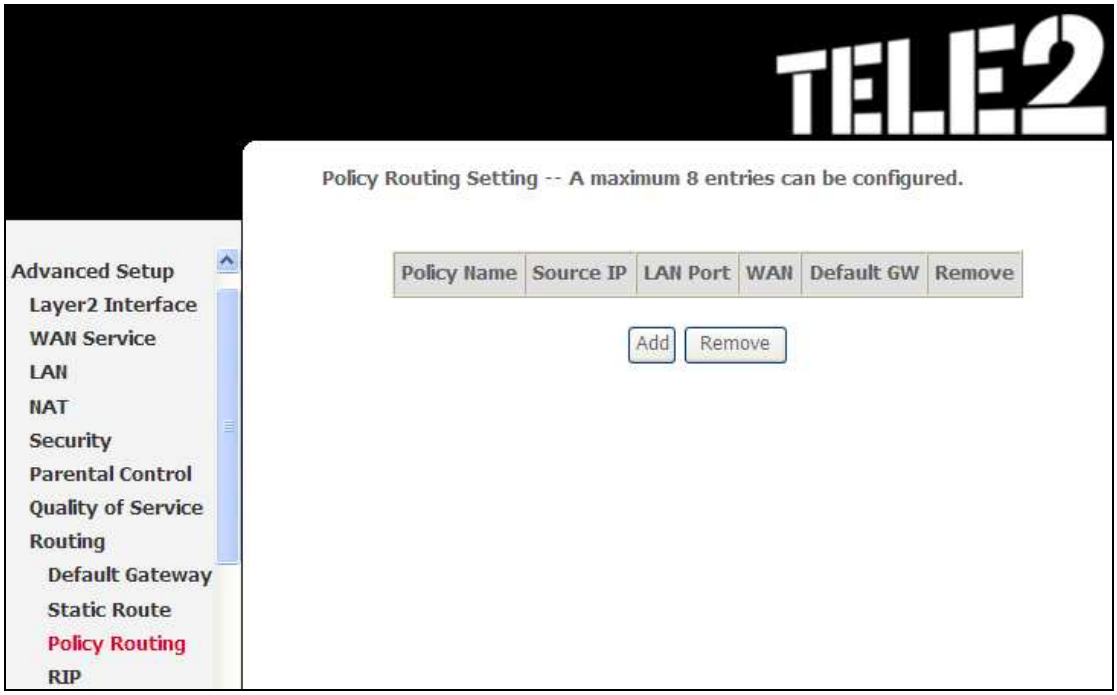
After clicking **Add** the following screen will display.



Input the Destination IP Address, select the interface type, Input the Gateway IP, (and the Metric number if required). Then, click **Apply/Save** to add an entry to the routing table.

5.8.3 Policy Routing

This page allows users configure the outgoing WAN interface (depending on source IP or LAN port).

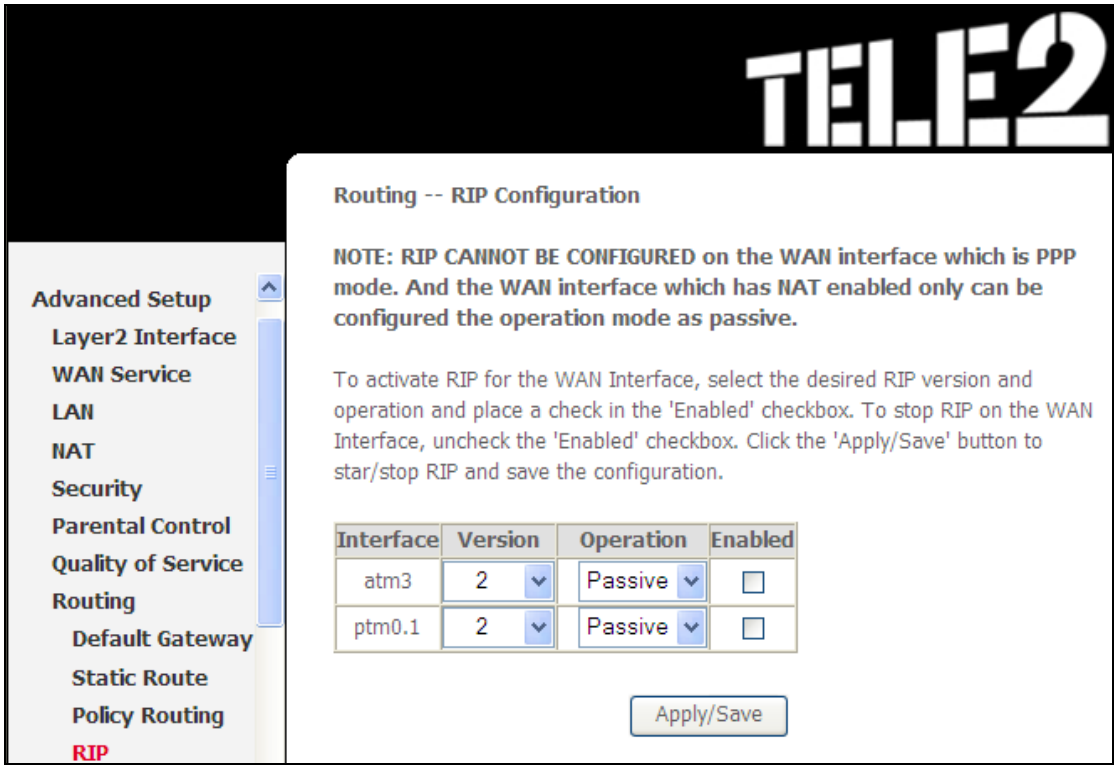


Click **Add** to create an entry or click **Remove** to delete an entry.

Input a Policy Name and select the Physical LAN Port. Then, input the Source IP, select which Interface to use and input the Default Gateway IP. Click **Apply/Save** to add the entry to the policy routing table.

5.8.4 RIP

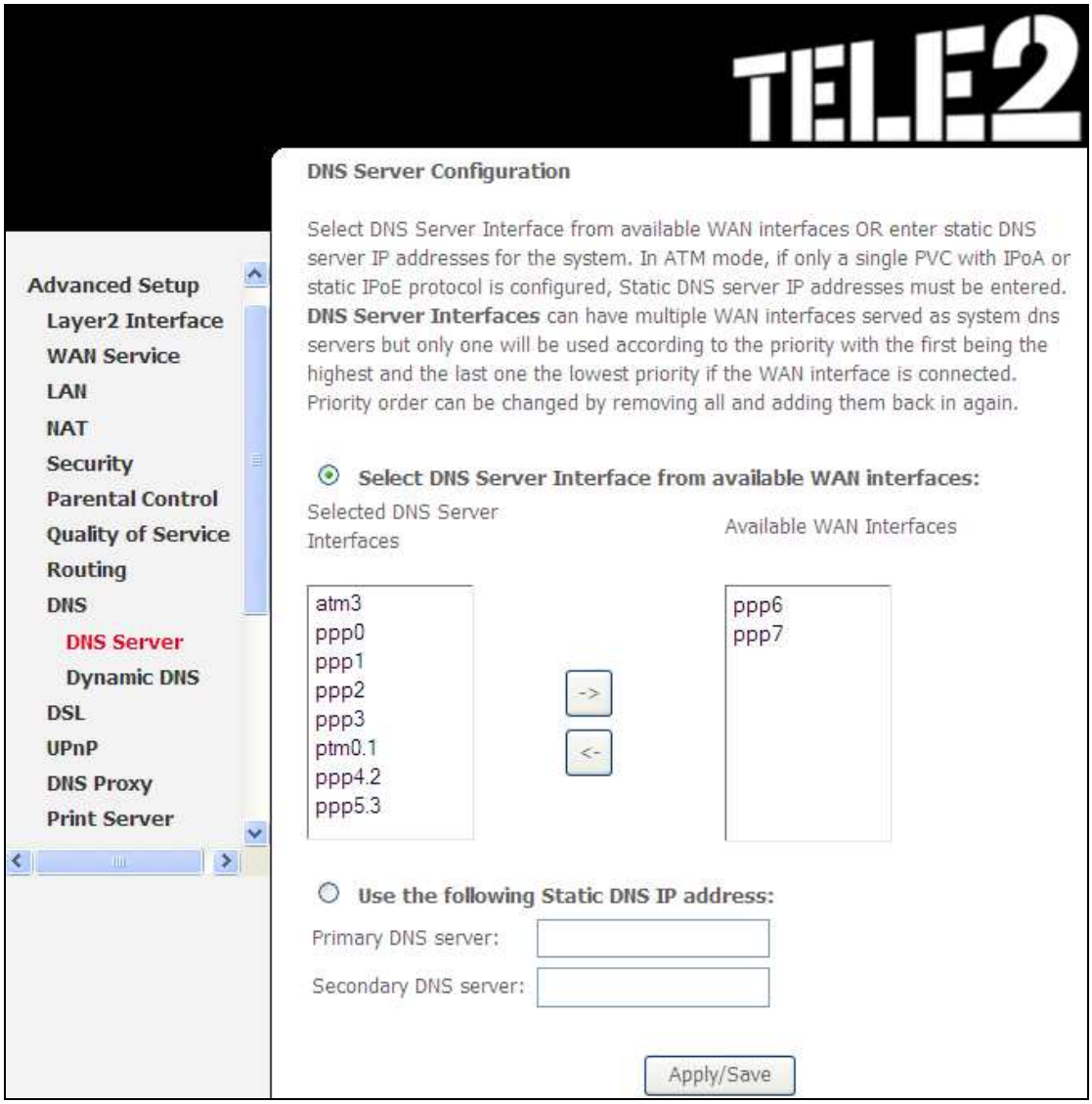
To activate RIP, select the **Enabled** radio button for Global RIP Mode. To configure an individual interface (PVC), select the desired RIP Version and Operation, and then select the **Enabled** checkbox ☑ for that interface (PVC). Click **Apply**/**Save** to save the configuration and start/stop RIP (based on the Global RIP mode selected).


Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Routing
Default Gateway
Static Route
Policy Routing
RIP
Routing -- RIP Configuration
NOTE: RIP CANNOT BE CONFIGURED on the WAN interface which is PPP mode. And the WAN interface which has NAT enabled only can be configured the operation mode as passive.
To activate RIP for the WAN Interface, select the desired RIP version and operation and place a check in the 'Enabled' checkbox. To stop RIP on the WAN Interface, uncheck the 'Enabled' checkbox. Click the 'Apply/Save' button to star/stop RIP and save the configuration.
Interface
Version
Operation
Enabled
atm3
2
Passive
ptm0.1
2
Passive
Apply/Save

5.9 DNS

5.9.1 DNS Server

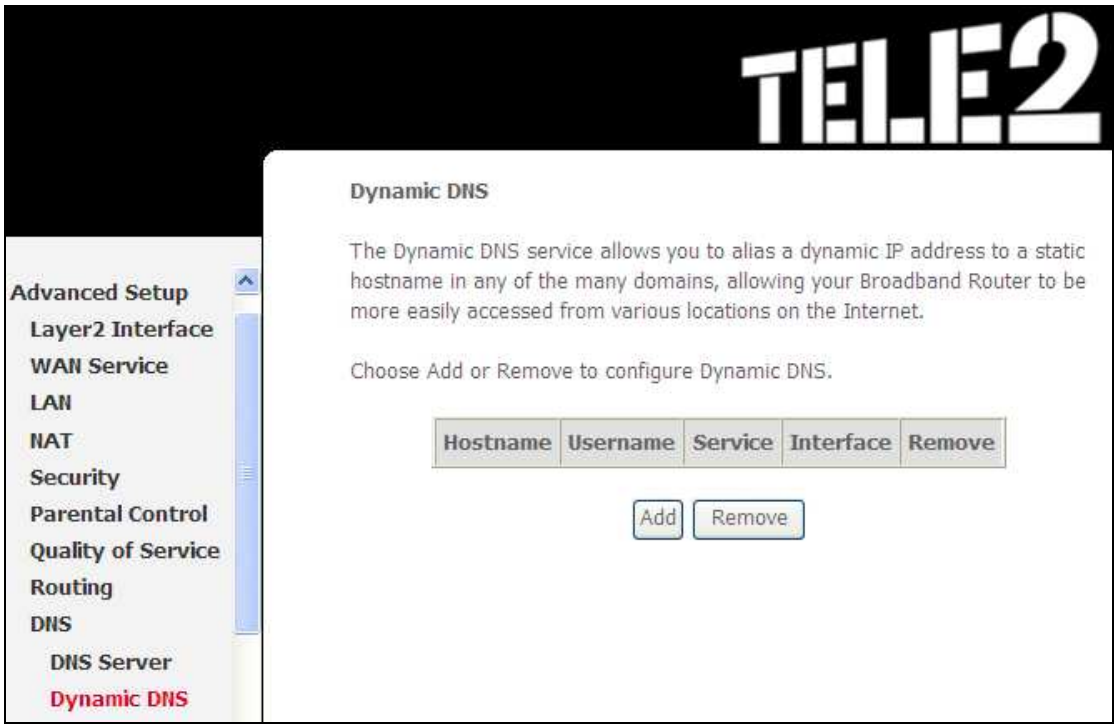
Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.


TELE2
Advanced Setup
Layer2 Interface
WAN Service
LAN
NAT
Security
Parental Control
Quality of Service
Routing
DNS
DNS Server
Dynamic DNS
DSL
UPnP
DNS Proxy
Print Server
DNS Server Configuration
Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered. DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the highest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Select DNS Server Interface from available WAN interfaces:
Selected DNS Server Interfaces
Available WAN Interfaces
atm3
ppp0
ppp1
ppp2
ppp3
ptm0.1
ppp4.2
ppp5.3
->
<-
ppp6
ppp7
Use the following Static DNS IP address:
Primary DNS server:
Secondary DNS server:
Apply/Save

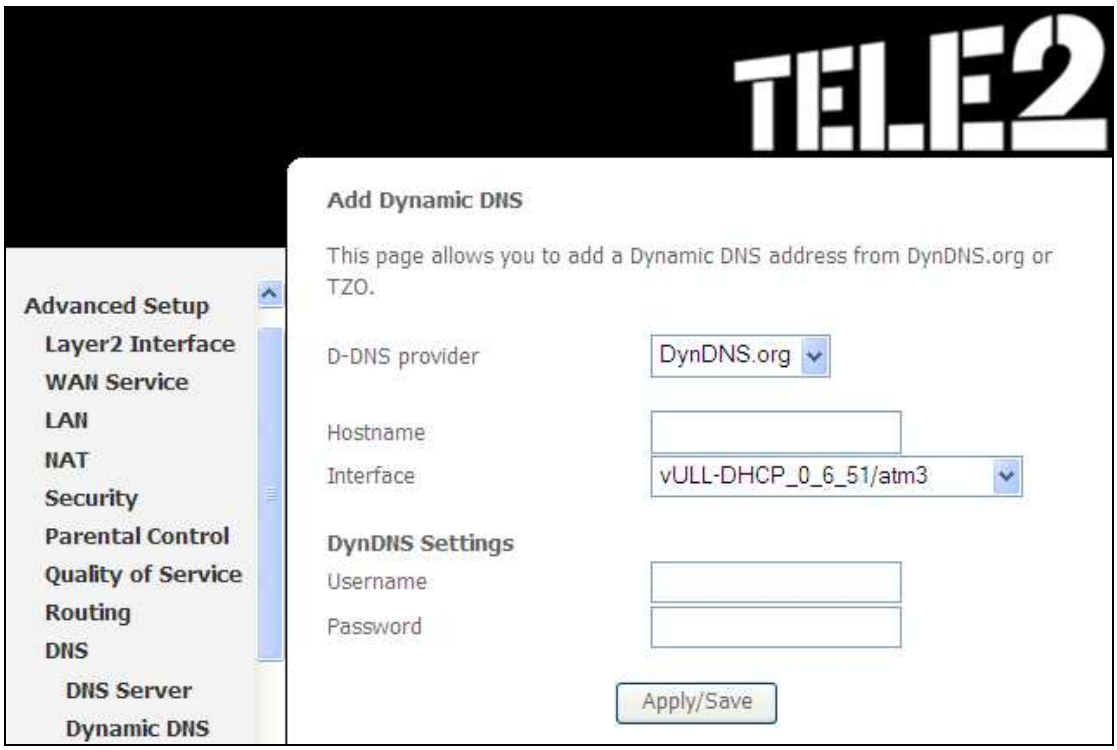
Click Apply/Save to save the new configuration.

5.9.2 Dynamic DNS

The Dynamic DNS service allows you to map a dynamic IP address to a static hostname in any of many domains, allowing the VI-3223u to be more easily accessed from various locations on the Internet.



To add a dynamic DNS service, click **Add**. The following screen will display.

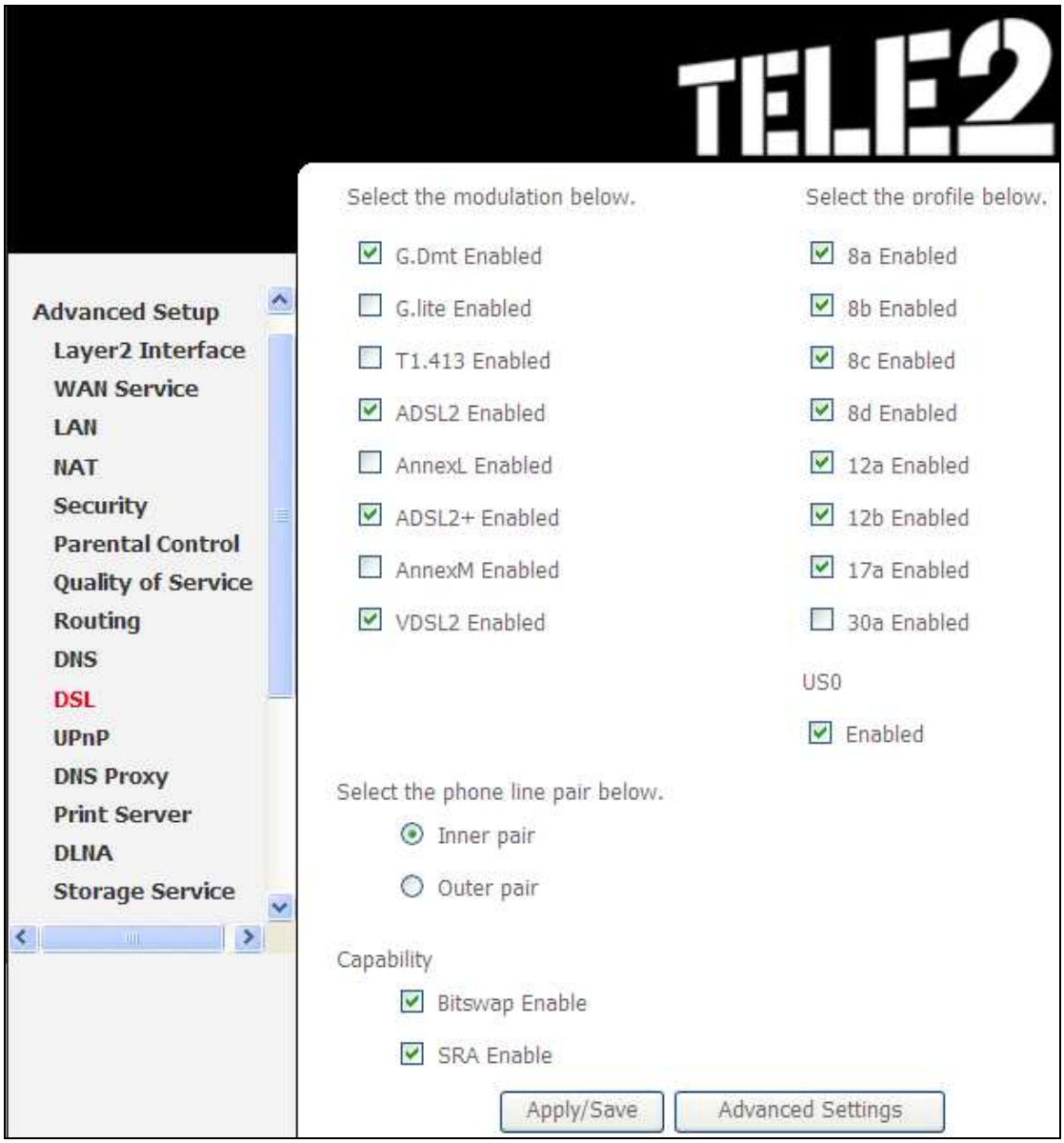


Consult the table below for field descriptions.

Field	Description
D-DNS provider	Select a dynamic DNS provider from the list
Hostname	Enter the name of the dynamic DNS server
Interface	Select the interface from the list
Username	Enter the username of the dynamic DNS server
Password	Enter the password of the dynamic DNS server

5.10 DSL

The DSL Settings screen allows for the selection of DSL modulation modes.
For optimum performance, the modes selected should match those of your ISP.



DSL Mode	Data Transmission Rate - Mbps (Megabits per second)	
G.Dmt	Downstream: 12 Mbps	Upstream: 1.3 Mbps
G.lite	Downstream: 4 Mbps	Upstream: 0.5 Mbps
T1.413	Downstream: 8 Mbps	Upstream: 1.0 Mbps
ADSL2	Downstream: 12 Mbps	Upstream: 1.0 Mbps
AnnexL	Supports longer loops but with reduced transmission rates	
ADSL2+	Downstream: 24 Mbps	Upstream: 1.0 Mbps
AnnexM	Downstream: 24 Mbps	Upstream: 3.5 Mbps
Options	**Description**	

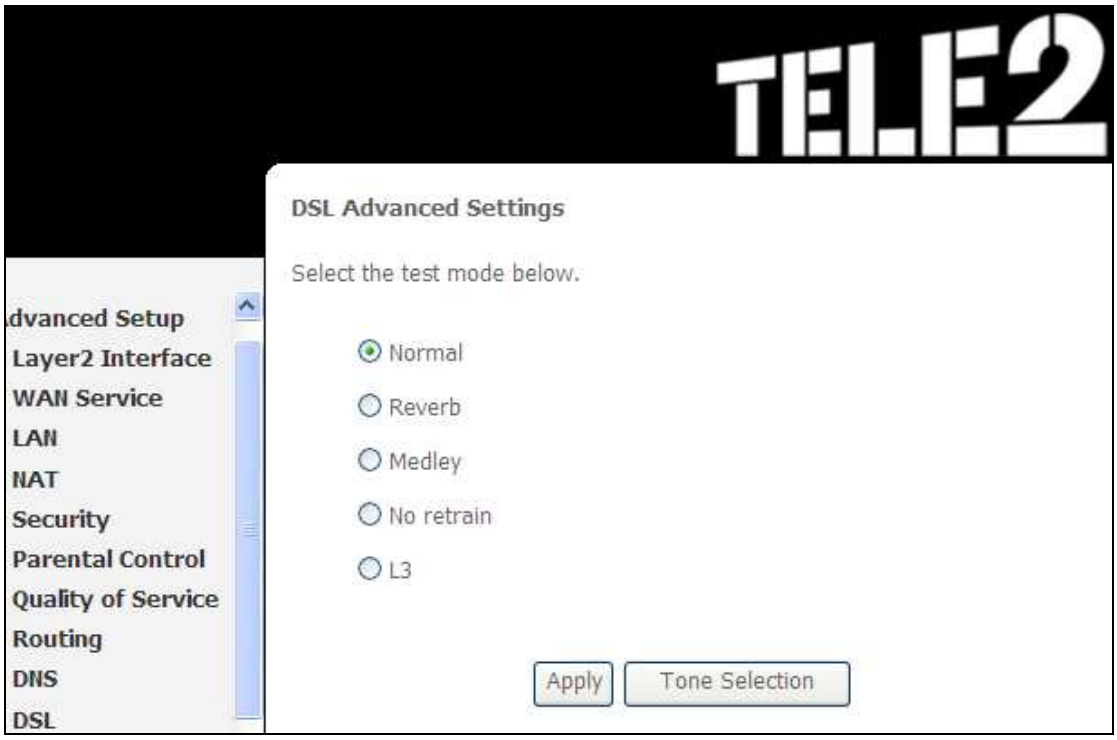
DSL Mode	Data Transmission Rate - Mbps (Megabits per second)
Inner/Outer Pair	Select the inner or outer pins of the twisted pair (RJ11 cable)
Bitswap Enable	Enables adaptive handshaking functionality
SRA Enable	Enables Seamless Rate Adaptation (SRA)

VDSL2 is quite a complex protocol. The standard defines a wide range of profiles that can be used in different VDSL deployment architectures; in the central office, in the cabinet or in the building for example.

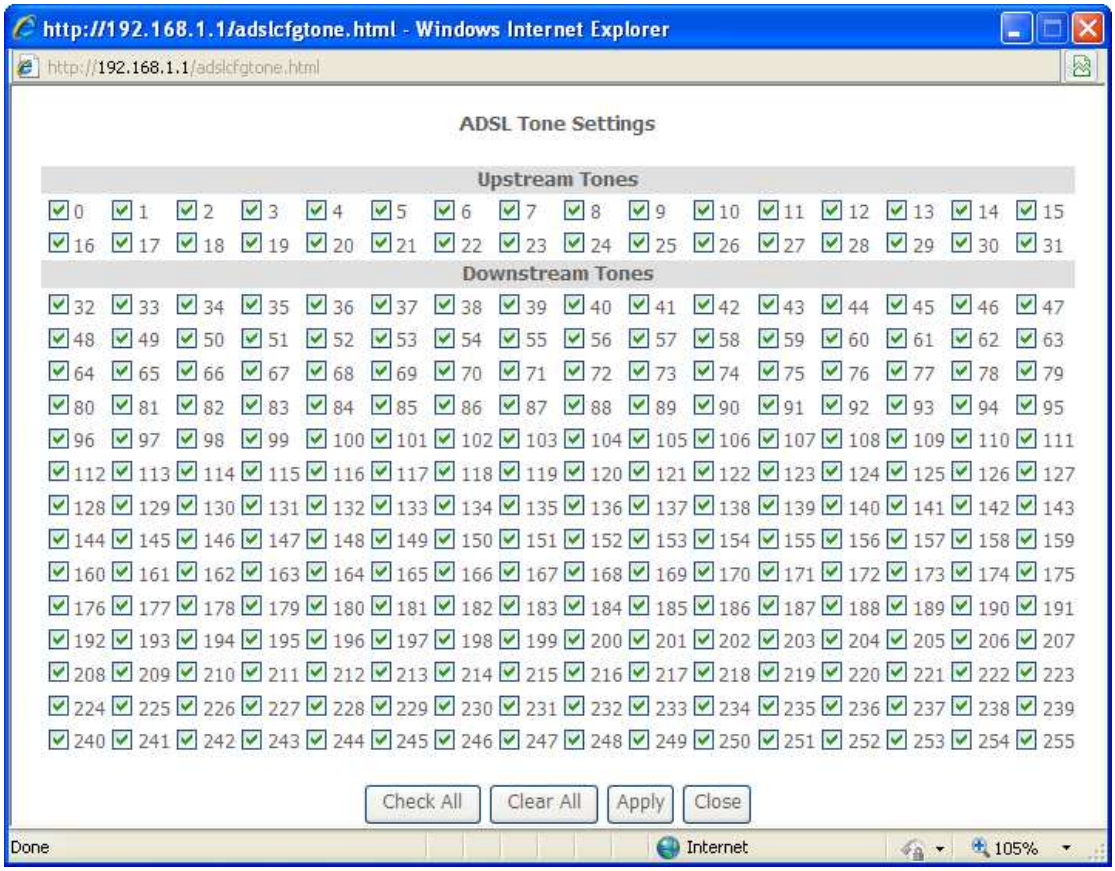
Profile	Bandwidth (MHz)	Number of carriers	Carrier bandwidth (kHz)	Power (dBm)	Max. downstream throughput (Mbit/s)
8a	8.832	2048	4.3125	+17.5	50
8b	8.832	2048	4.3125	+20.5	50
8c	8.5	1972	4.3125	+11.5	50
8d	8.832	2048	4.3125	+14.5	50
12a	12	2783	4.3125	+14.5	68
12b	12	2783	4.3125	+14.5	68
17a	17.664	4096	4.3125	+14.5	100
30a	30	3479	8.625	+14.5	200

Advanced DSL Settings

Click **Advanced Settings** to reveal additional options. On the following screen you can select a test mode or modify tones by clicking **Tone Selection**. Click **Apply** to implement these settings and return to the previous screen.

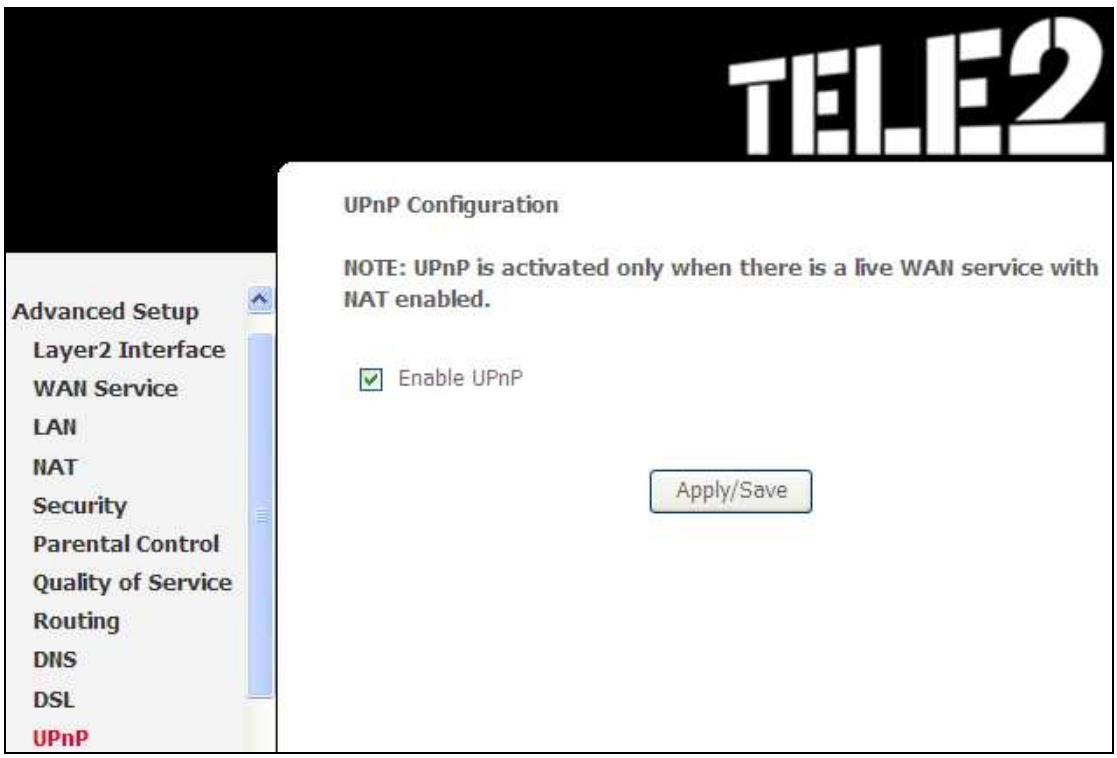


On this screen you select the tones you want activated, then click **Apply** and **Close**.



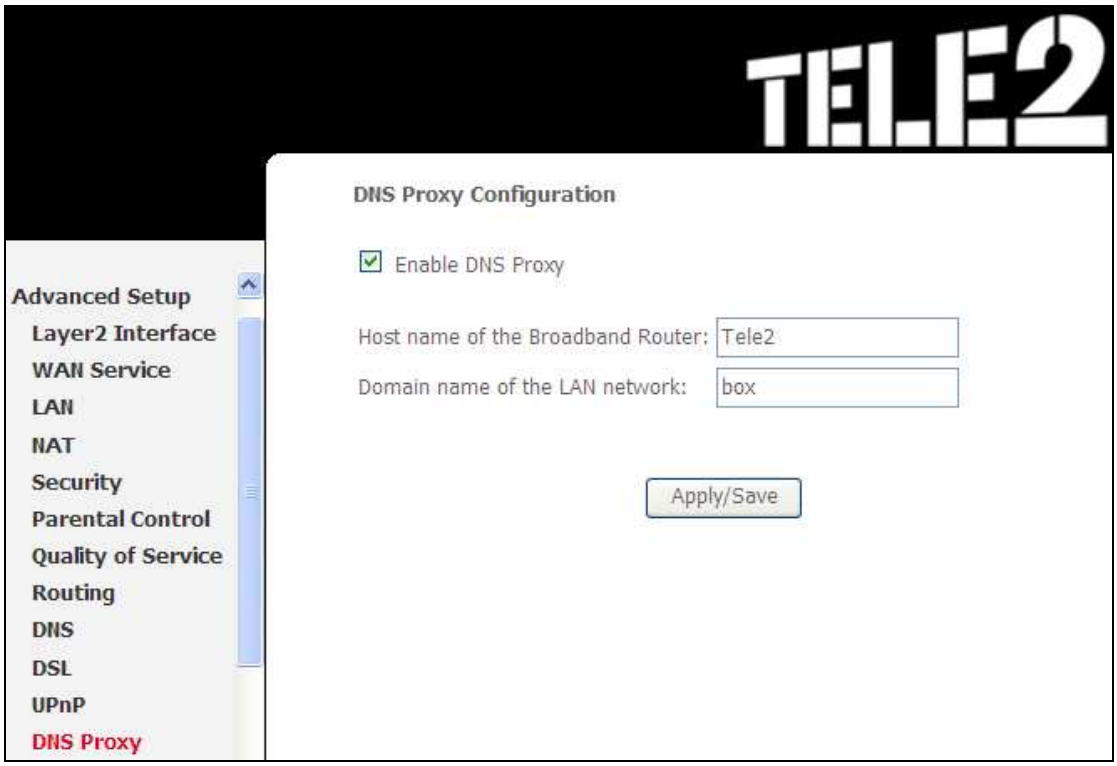
5.11 UPnP

Select the checkbox ☑ provided and click **Apply/Save** to enable UPnP protocol.



5.12 DNS Proxy

DNS proxy receives DNS queries and forwards DNS queries to the Internet. After the CPE gets answers from the DNS server, it replies to the LAN clients. Configure DNS proxy with the default setting, when the PC gets an IP via DHCP, the domain name, Home, will be added to PC's DNS Suffix Search List, and the PC can access route with "Tele2.box".



5.13 Print Server

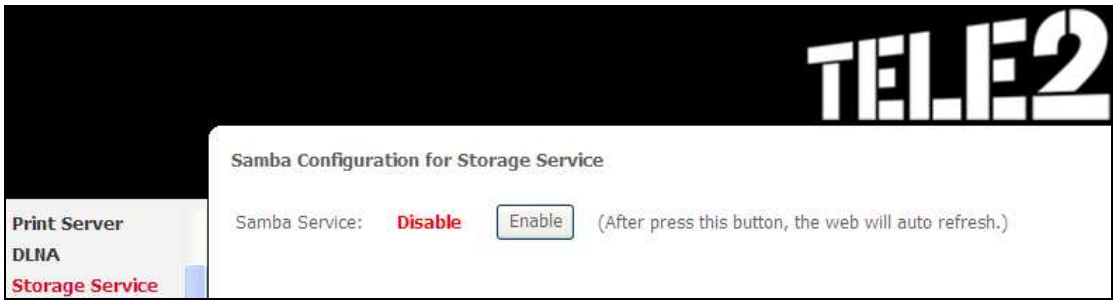
The VI-3223u can provide printer support through an optional USB2.0 host port. If your device has this port, refer to Appendix F - Printer Server for detailed setup instructions.

5.14 DLNA

Enabling DLNA allows users to share digital media, like pictures, music and video, to other LAN devices from the digital media server.

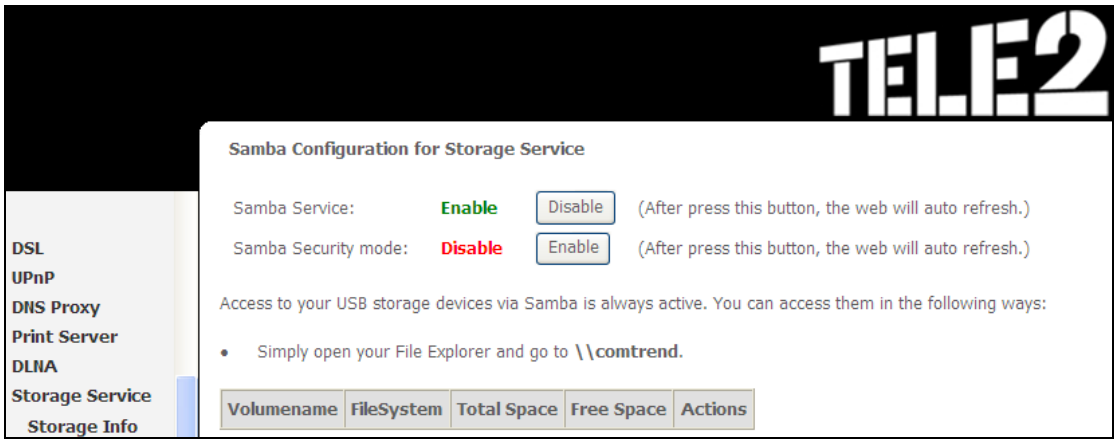
5.15 Storage Service

The Storage service allows you to use Storage devices with modem to be more easily accessed.



Click the **Enable** button and the following window will pop up.

Click **OK** to enable the Samba Service.

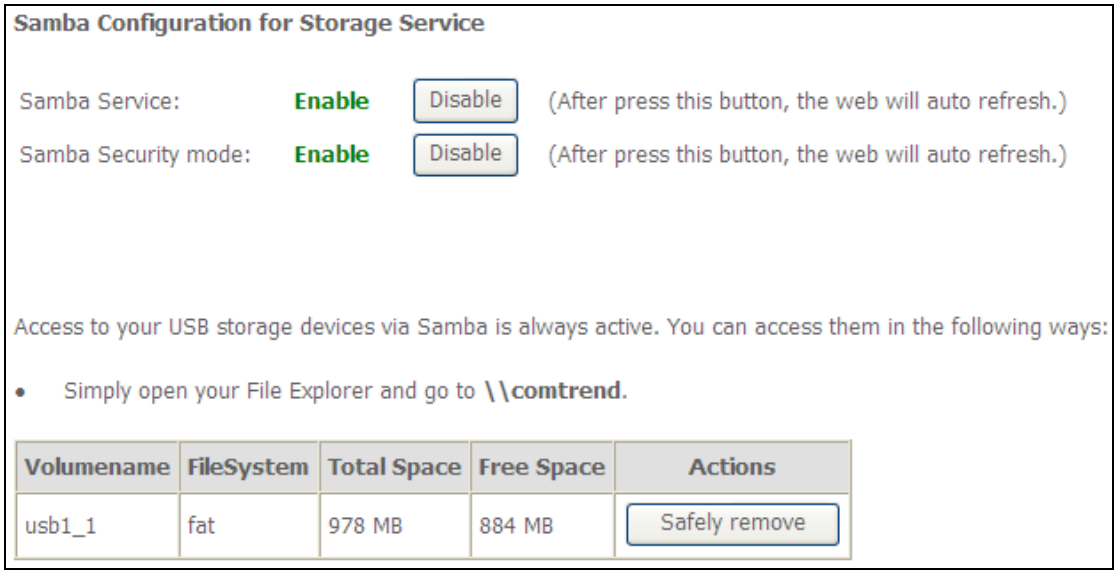


The Samba Security mode can also be enabled by clicking the **Enable** button. The following window will pop up.

Click **OK** to enable the Samba Security mode.

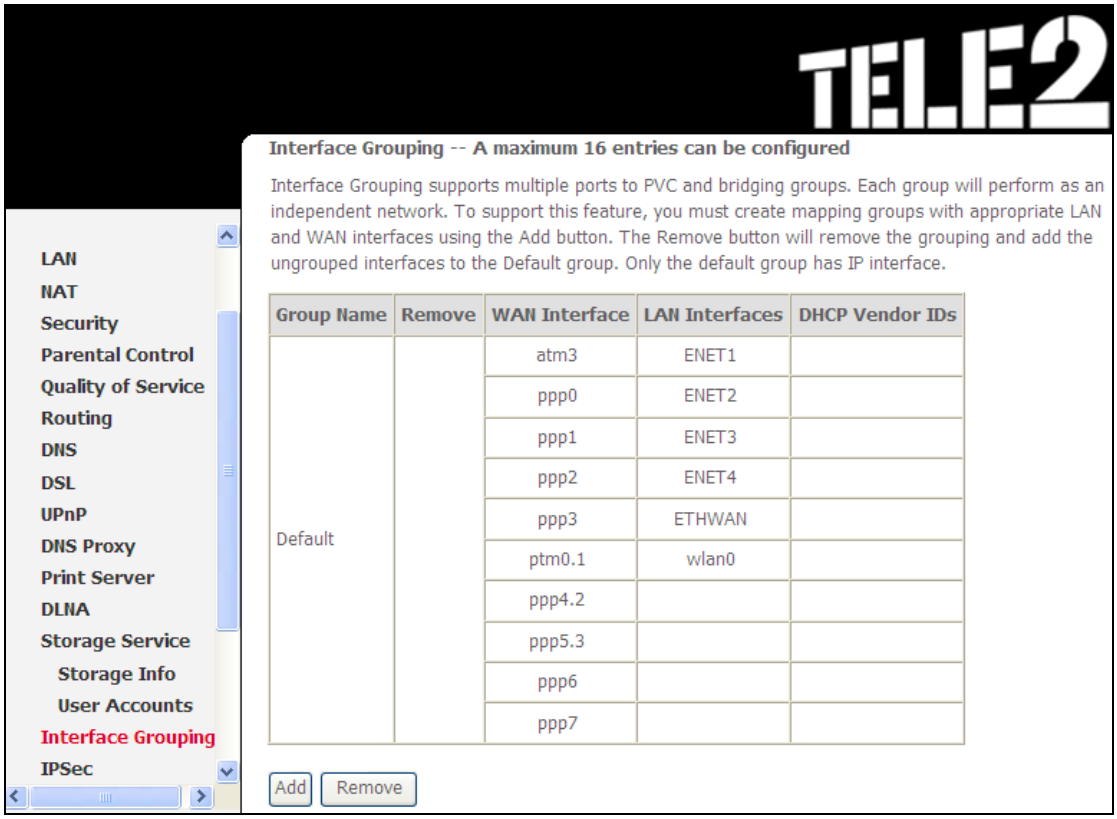
5.15.1 Storage Device Info

Display after storage device attached (for your reference).

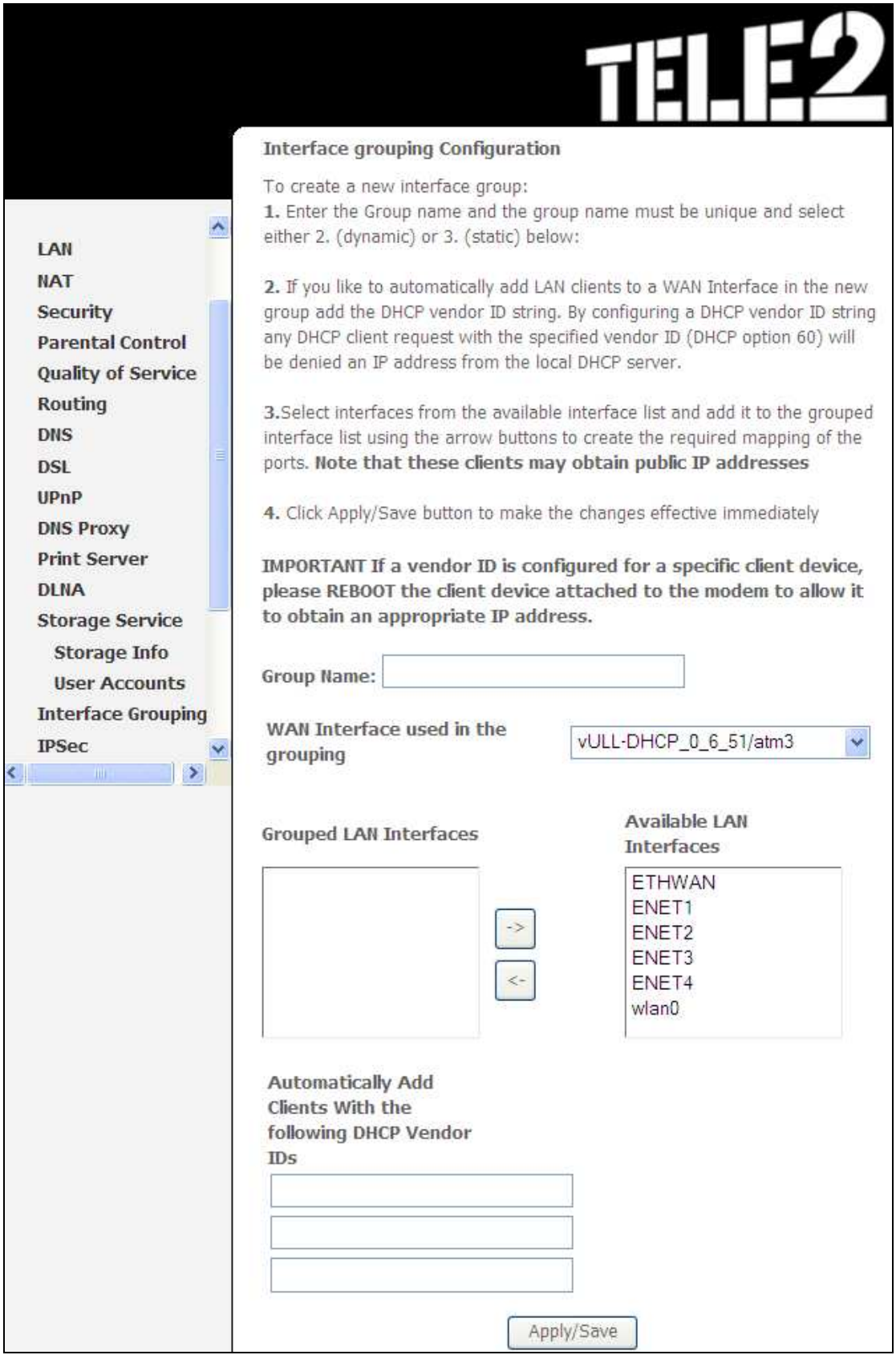

Samba Configuration for Storage Service
Samba Service: Enable Disable (After press this button, the web will auto refresh.)
Samba Security mode: Enable Disable (After press this button, the web will auto refresh.)
Access to your USB storage devices via Samba is always active. You can access them in the following ways:
Simply open your File Explorer and go to \\comtrend.
Volumename FileSystem Total Space Free Space Actions
usb1_1 fat 978 MB 884 MB Safely remove

5.16 Interface Grouping

Interface Grouping supports multiple ports to PVC and bridging groups. Each group performs as an independent network. To use this feature, you must create mapping groups with appropriate LAN and WAN interfaces using the **Add** button.
The **Remove** button removes mapping groups, returning the ungrouped interfaces to the Default group. Only the default group has an IP interface.



To add an Interface Group, click the **Add** button. The following screen will appear. It lists the available and grouped interfaces. Follow the instructions shown onscreen.


TELE2
Interface grouping Configuration
To create a new interface group:
1. Enter the Group name and the group name must be unique and select either 2. (dynamic) or 3. (static) below:
2. If you like to automatically add LAN clients to a WAN Interface in the new group add the DHCP vendor ID string. By configuring a DHCP vendor ID string any DHCP client request with the specified vendor ID (DHCP option 60) will be denied an IP address from the local DHCP server.
3.Select interfaces from the available interface list and add it to the grouped interface list using the arrow buttons to create the required mapping of the ports. Note that these clients may obtain public IP addresses
4. Click Apply/Save button to make the changes effective immediately
IMPORTANT If a vendor ID is configured for a specific client device, please REBOOT the client device attached to the modem to allow it to obtain an appropriate IP address.
Group Name:
WAN Interface used in the grouping
vULL-DHCP_0_6_51/atm3
Grouped LAN Interfaces
Available LAN Interfaces
ETHWAN
ENET1
ENET2
ENET3
ENET4
wlan0
->
<-
Automatically Add Clients With the following DHCP Vendor IDs
Apply/Save
LAN
NAT
Security
Parental Control
Quality of Service
Routing
DNS
DSL
UPnP
DNS Proxy
Print Server
DLNA
Storage Service
Storage Info
User Accounts
Interface Grouping
IPSec

Automatically Add Clients With Following DHCP Vendor IDs:

Add support to automatically map LAN interfaces to PVC's using DHCP vendor ID (option 60). The local DHCP server will decline and send the requests to a remote DHCP server by mapping the appropriate LAN interface. This will be turned on when Interface Grouping is enabled.

For example, imagine there are 4 PVCs (0/33, 0/36, 0/37, 0/38). VPI/VCI=0/33 is for PPPoE while the other PVCs are for IP set-top box (video). The LAN interfaces are ENET1, ENET2, ENET3, and ENET4.

The Interface Grouping configuration will be:

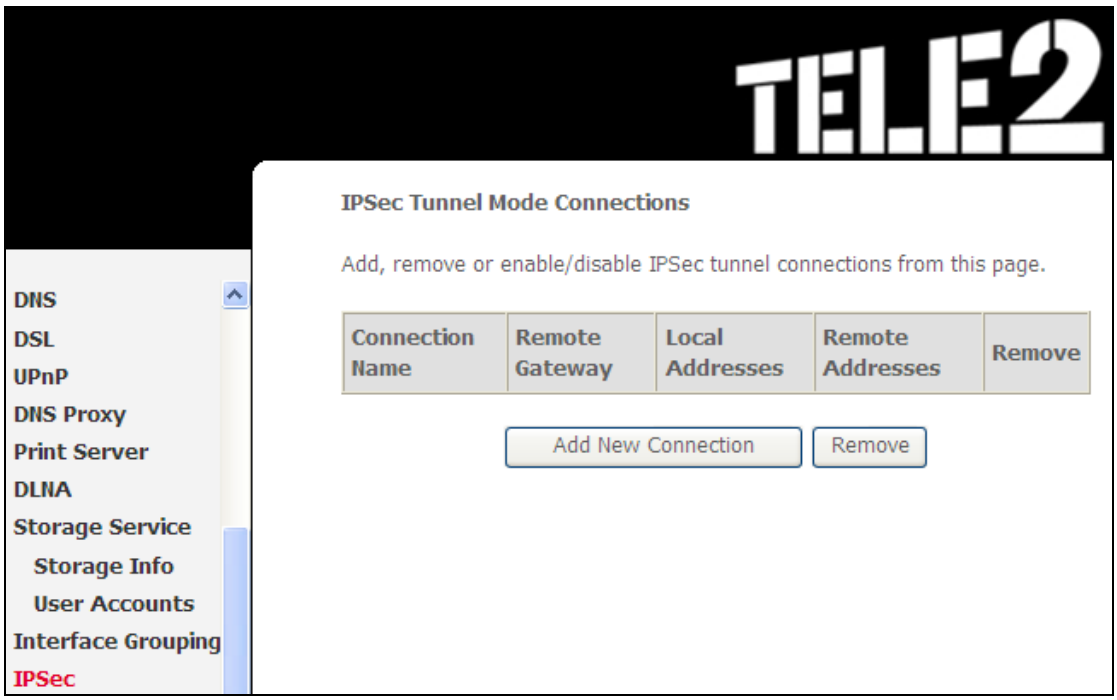
1. Default: ENET1, ENET2, ENET3, and ENET4.
2. Video: nas_0_36, nas_0_37, and nas_0_38. The DHCP vendor ID is "Video".
If the onboard DHCP server is running on "Default" and the remote DHCP server is running on PVC 0/36 (i.e. for set-top box use only). LAN side clients can get IP addresses from the CPE's DHCP server and access the Internet via PPPoE (0/33).

If a set-top box is connected to ENET1 and sends a DHCP request with vendor ID "Video", the local DHCP server will forward this request to the remote DHCP server. The Interface Grouping configuration will automatically change to the following:

1. Default: ENET2, ENET3, and ENET4
2. Video: nas_0_36, nas_0_37, nas_0_38, and ENET1.

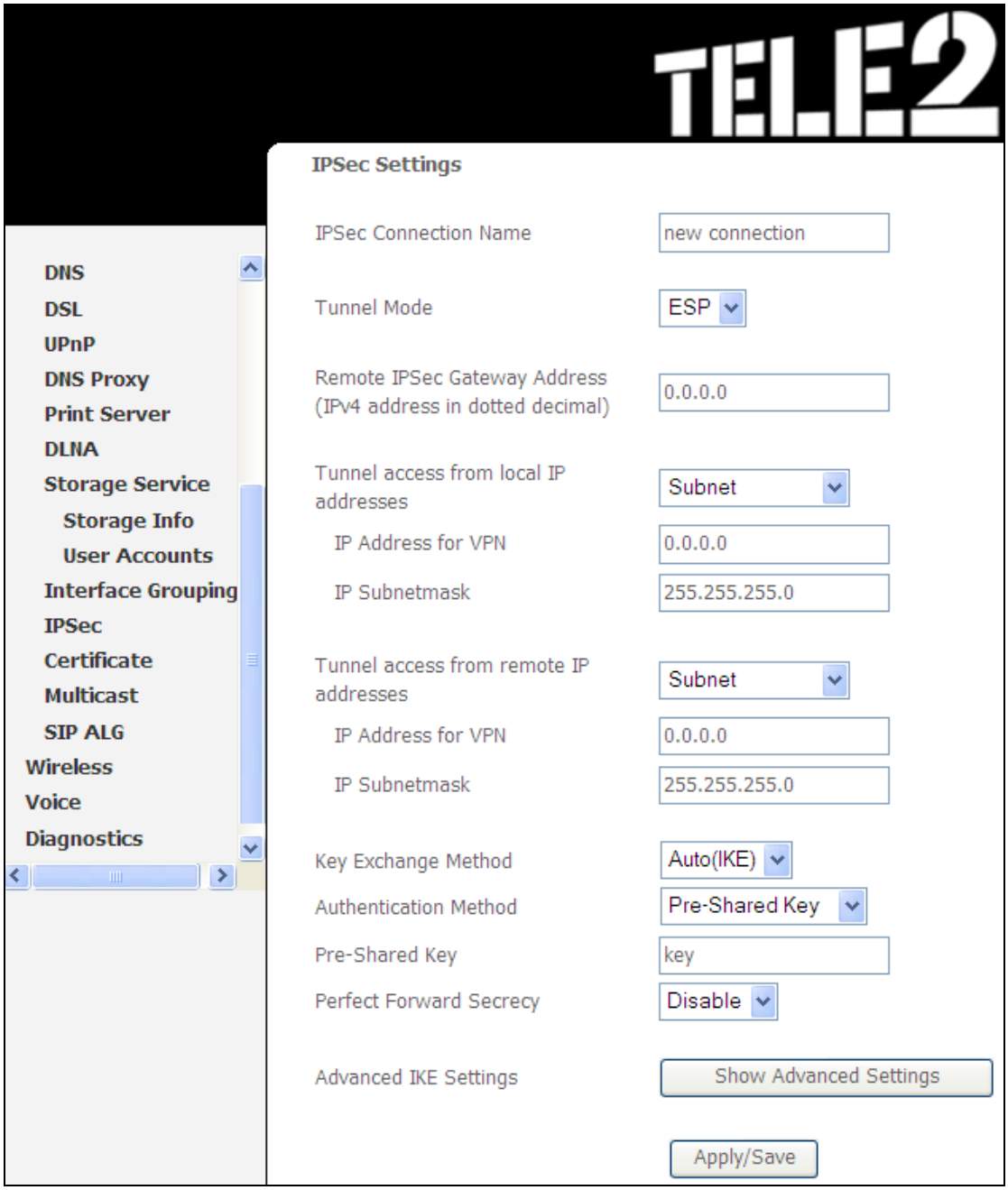
5.17 IPSec

You can add, edit or remove IPSec tunnel mode connections from this page.



Click **Add New Connection** to add a new IPSec termination rule.

The following screen will display.



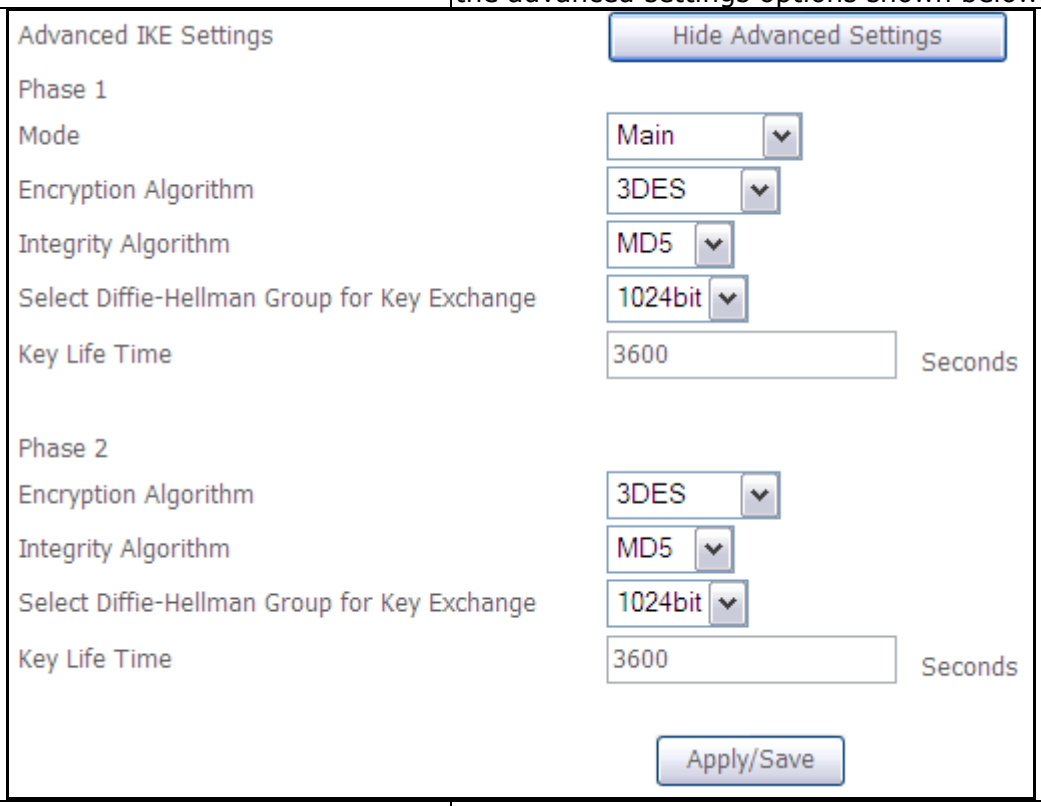
IPSec Connection Name	User-defined label
Tunnel Mode	Select tunnel protocol, AH (Authentication Header) or ESP (Encapsulating Security Payload) for this tunnel.
Remote IPSec Gateway Address	The location of the Remote IPSec Gateway. IP address or domain name can be used.
Tunnel access from local IP addresses	Specify the acceptable host IP on the local side. Choose **Single** or **Subnet**.
IP Address/Subnet Mask for VPN	If you chose **Single**, please enter the host IP address for VPN. If you chose **Subnet**, please enter the subnet information for VPN.
Tunnel access from remote IP addresses	Specify the acceptable host IP on the remote side. Choose **Single** or **Subnet**.

IP Address/Subnet Mask for VPN	If you chose **Single**, please enter the host IP address for VPN. If you chose **Subnet**, please enter the subnet information for VPN.
Key Exchange Method	Select from Auto(IKE) or Manual

For the Auto(IKE) key exchange method, select Pre-shared key or Certificate (X.509) authentication. For Pre-shared key authentication you must enter a key, while for Certificate (X.509) authentication you must select a certificate from the list.

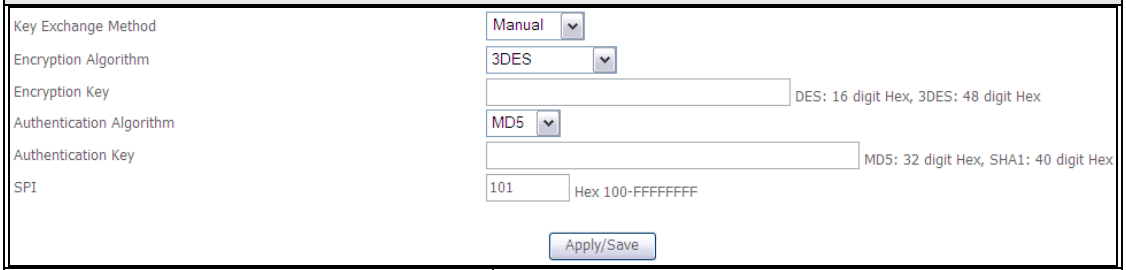
See the tables below for a summary of all available options.

Auto(IKE) Key Exchange Method	
Pre-Shared Key / Certificate (X.509)	Input Pre-shared key / Choose Certificate
Perfect Forward Secrecy	Enable or Disable
Advanced IKE Settings	Select **Show Advanced Settings** to reveal the advanced settings options shown below.



Advanced IKE Settings	Select **Hide Advanced Settings** to hide the advanced settings options shown above.
Phase 1 / Phase 2	Choose settings for each phase, the available options are separated with a "/" character.
Mode	Main / Aggressive
Encryption Algorithm	DES / 3DES / AES 128,192,256
Integrity Algorithm	MD5 / SHA1
Select Diffie-Hellman Group	768 – 8192 bit
Key Life Time	Enter your own or use the default (1 hour)

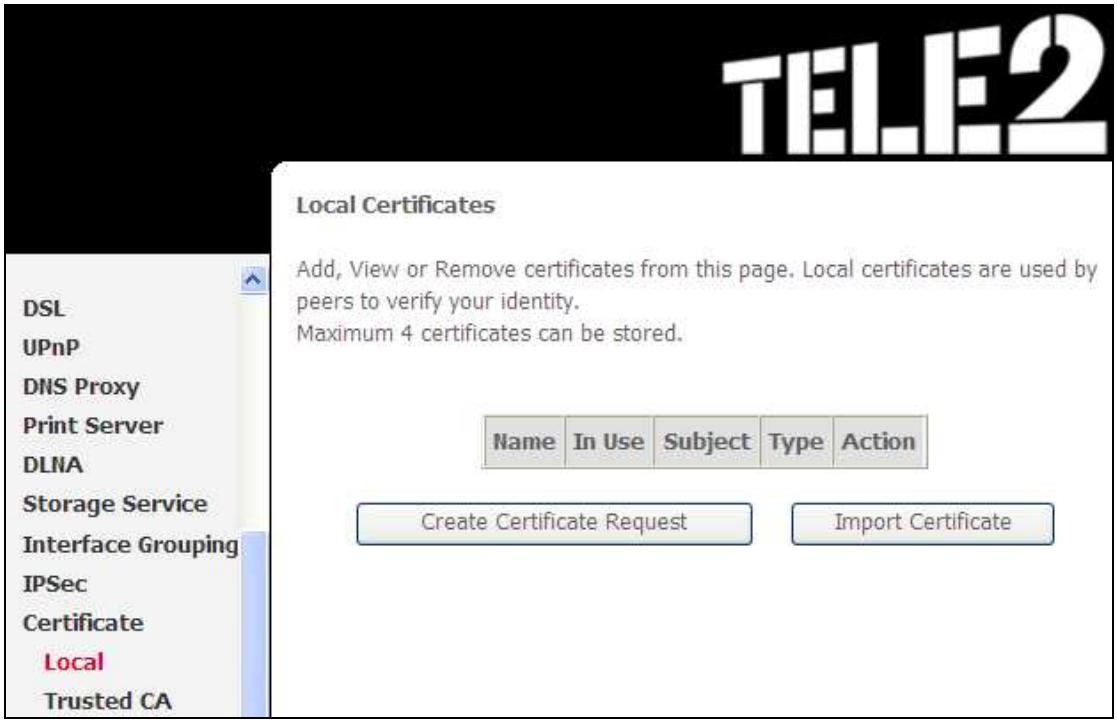
The Manual key exchange method options are summarized in the table below.

Manual Key Exchange Method	
	
Encryption Algorithm	DES / 3DES / AES (aes-cbc)
Encryption Key	DES: 16 digit Hex, 3DES: 48 digit Hex
Authentication Algorithm	MD5 / SHA1
Authentication Key	MD5: 32 digit Hex, SHA1: 40 digit Hex
SPI (default is 101)	Enter a Hex value from 100-FFFFFFFF

5.18 Certificate

A certificate is a public key, attached with its owner's information (company name, server name, personal real name, contact e-mail, postal address, etc) and digital signatures. There will be one or more digital signatures attached to the certificate, indicating that these entities have verified that this certificate is valid.

5.18.1 Local



CREATE CERTIFICATE REQUEST

Click **Create Certificate Request** to generate a certificate-signing request.

The certificate-signing request can be submitted to the vendor/ISP/ITSP to apply for a certificate. Some information must be included in the certificate-signing request. Your vendor/ISP/ITSP will ask you to provide the information they require and to provide the information in the format they regulate. Enter the required information and click **Apply** to generate a private key and a certificate-signing request.

The following table is provided for your reference.

Field	Description
Certificate Name	A user-defined name for the certificate.
Common Name	Usually, the fully qualified domain name for the machine.
Organization Name	The exact legal name of your organization. Do not abbreviate.
State/Province Name	The state or province where your organization is located. It cannot be abbreviated.
Country/Region Name	The two-letter ISO abbreviation for your country.

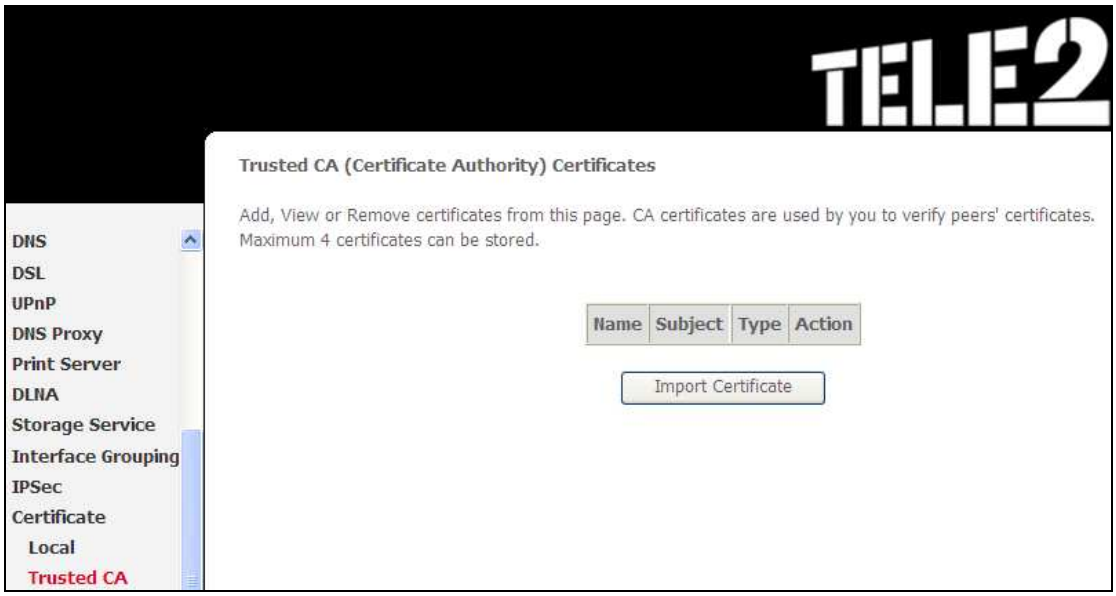
IMPORT CERTIFICATE

Click **Import Certificate** to paste the certificate content and the private key provided by your vendor/ISP/ITSP into the corresponding boxes shown below.

Enter a certificate name and click **Apply** to import the local certificate.

5.18.2 Trusted CA

CA is an abbreviation for Certificate Authority, which is a part of the X.509 system. It is itself a certificate, attached with the owner information of this certificate authority; but its purpose is not encryption/decryption. Its purpose is to sign and issue certificates, in order to prove that these certificates are valid.

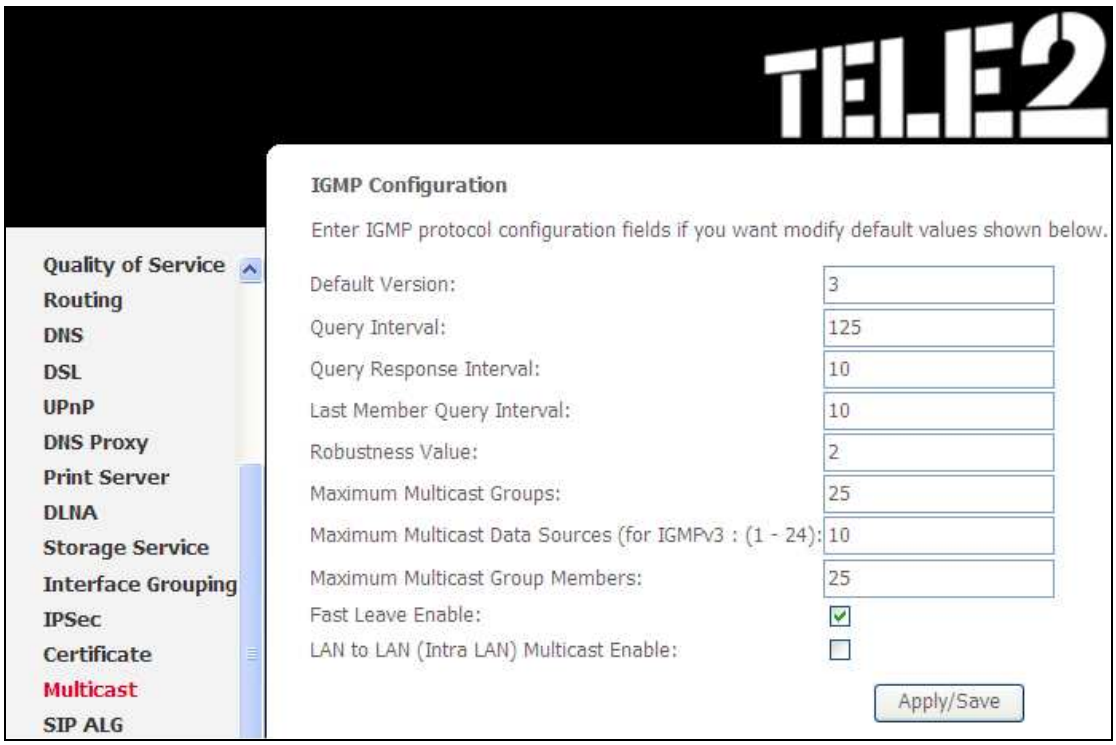


Click **Import Certificate** to paste the certificate content of your trusted CA. The CA certificate content will be provided by your vendor/ISP/ITSP and is used to authenticate the Auto-Configuration Server (ACS) that the CPE will connect to.

Enter a certificate name and click **Apply** to import the CA certificate.

5.19 Multicast

Input new IGMP protocol configuration fields if you want modify default values shown. Then click Apply/Save.

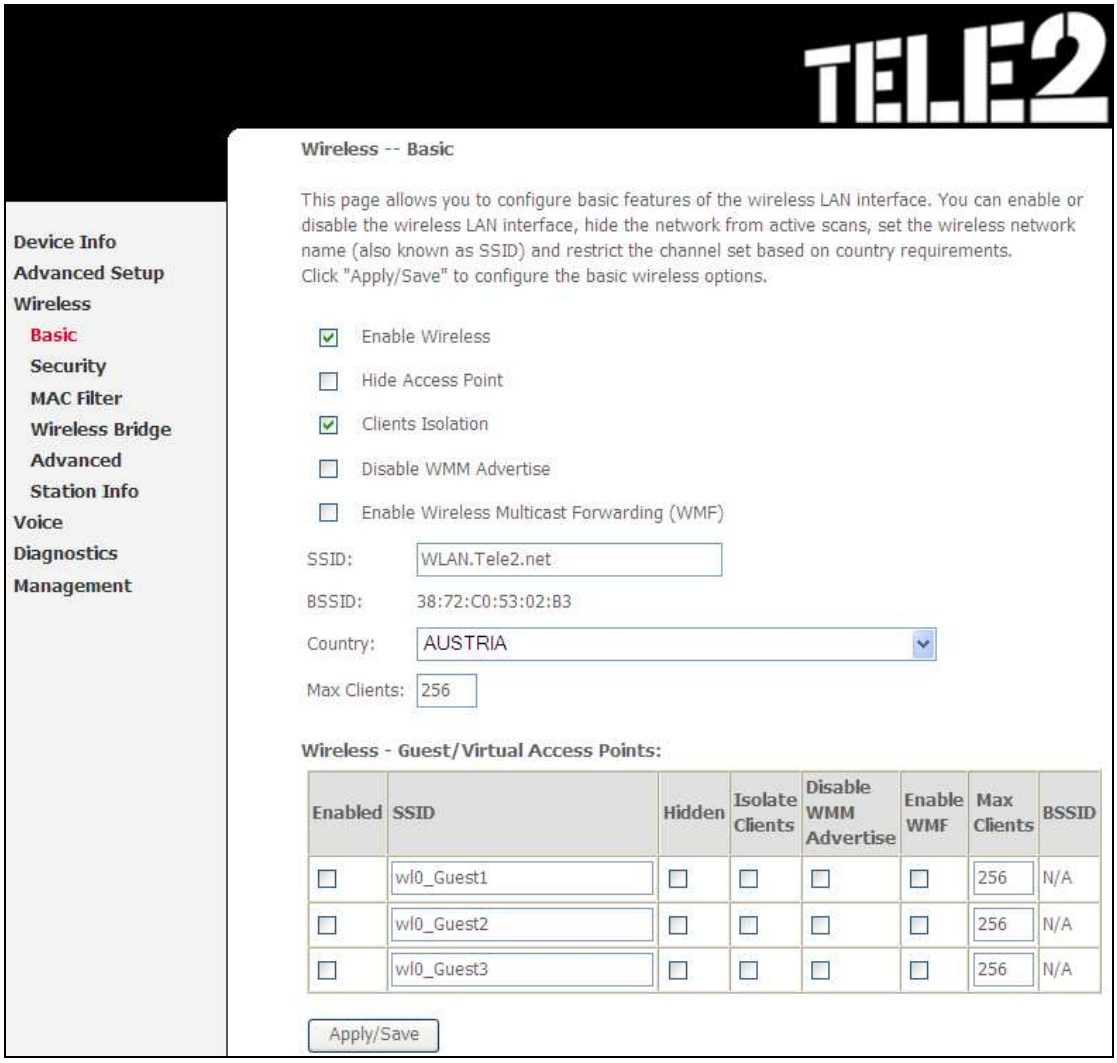


Chapter 6 Wireless

The Wireless menu provides access to the wireless options discussed below.

6.1 Basic

The Basic option allows you to configure basic features of the wireless LAN interface. Among other things, you can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirements.


Device Info
Advanced Setup
Wireless
Basic
Security
MAC Filter
Wireless Bridge
Advanced
Station Info
Voice
Diagnostics
Management
Wireless -- Basic
This page allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirements.
Click "Apply/Save" to configure the basic wireless options.
Enable Wireless
Hide Access Point
Clients Isolation
Disable WMM Advertise
Enable Wireless Multicast Forwarding (WMF)
SSID: WLAN.Tele2.net
BSSID: 38:72:C0:53:02:B3
Country: AUSTRIA
Max Clients: 256
Wireless - Guest/Virtual Access Points:
Enabled SSID Hidden Isolate Clients Disable WMM Advertise Enable WMF Max Clients BSSID
wl0_Guest1 256 N/A
wl0_Guest2 256 N/A
wl0_Guest3 256 N/A
Apply/Save

Click **Apply/Save** to apply the selected wireless options.

Consult the table below for descriptions of these options.

Option	Description
Enable Wireless	A checkbox ☑ that enables or disables the wireless LAN interface. When selected, a set of basic wireless options will appear.

Option	Description
Hide Access Point	Select Hide Access Point to protect the access point from detection by wireless active scans. To check AP status in Windows XP, open **Network Connections** from the **start** Menu and select **View Available Network Connections**. If the access point is hidden, it will not be listed there. To connect a client to a hidden access point, the station must add the access point manually to its wireless configuration.
Clients Isolation	When enabled, it prevents client PCs from seeing one another in My Network Places or Network Neighborhood. Also, prevents one wireless client communicating with another wireless client.
Disable WMM Advertise	Stops the router from 'advertising' its Wireless Multimedia (WMM) functionality, which provides basic quality of service for time-sensitive applications (e.g. VoIP, Video).
Enable Wireless Multicast Forwarding	Select the checkbox ☑ to enable this function.
SSID [1-32 characters]	Sets the wireless network name. SSID stands for Service Set Identifier. All stations must be configured with the correct SSID to access the WLAN. If the SSID does not match, that user will not be granted access.
BSSID	The BSSID is a 48-bit identity used to identify a particular BSS (Basic Service Set) within an area. In Infrastructure BSS networks, the BSSID is the MAC (Media Access Control) address of the AP (Access Point); and in Independent BSS or ad hoc networks, the BSSID is generated randomly.
Country	A drop-down menu that permits worldwide and specific national settings. Local regulations limit channel range: US= worldwide, Japan=1-14, Jordan= 10-13, Israel= 1-13
Max Clients	The maximum number of clients that can access the router.
Wireless - Guest / Virtual Access Points	This router supports multiple SSIDs called Guest SSIDs or Virtual Access Points. To enable one or more Guest SSIDs select the checkboxes ☑ in the **Enabled** column. To hide a Guest SSID, select its checkbox ☑ in the **Hidden** column. Do the same for **Isolate Clients** and **Disable WMM Advertise**. For a description of these two functions, see the previous entries for "Clients Isolation" and "Disable WMM Advertise". Similarly, for **Enable WMF**, **Max Clients** and **BSSID**, consult the matching entries in this table. **NOTE:** Remote wireless hosts cannot scan Guest SSIDs.

6.2 Security

The following screen appears when Wireless Security is selected. The options shown here allow you to configure security features of the wireless LAN interface.

Click **Apply/Save** to implement new configuration settings.

WIRELESS SECURITY

Wireless security settings can be configured according to Wi-Fi Protected Setup (WPS) or Manual Setup. The WPS method configures security settings automatically (see

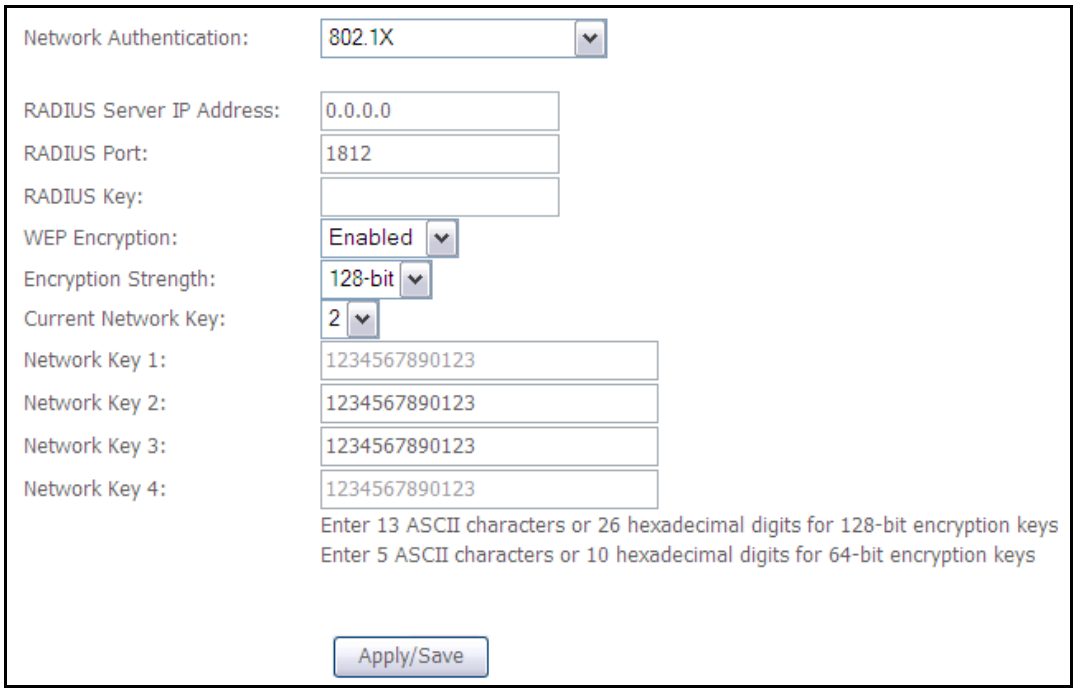
6.2.1 WPS) while the Manual Setup method requires that the user configure these settings using the Web User Interface (see the table below).

Select SSID
Select the wireless network name from the drop-down box. SSID stands for Service Set Identifier. All stations must be configured with the correct SSID to access the WLAN. If the SSID does not match, that client will not be granted access.

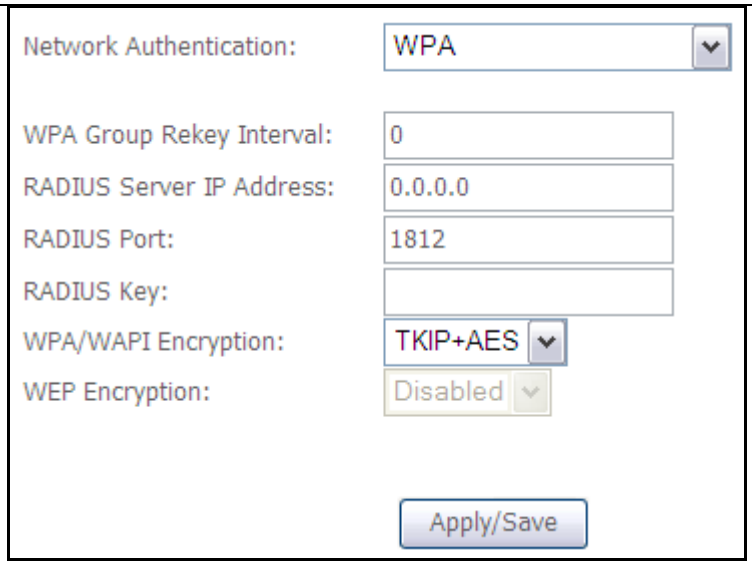
Network Authentication

This option specifies whether a network key is used for authentication to the wireless network. If network authentication is set to Open, then no authentication is provided. Despite this, the identity of the client is still verified.

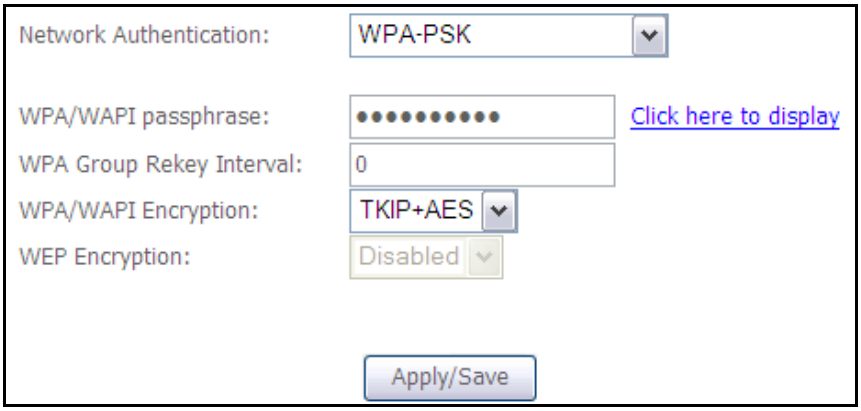
Each authentication type has its own settings. For example, selecting 802.1X authentication will reveal the RADIUS Server IP address, Port and Key fields. WEP Encryption will also be enabled as shown below.



The settings for WPA authentication are shown below.



The settings for WPA-PSK authentication are shown next.



WEP Encryption

This option specifies whether data sent over the network is encrypted. The same network key is used for data encryption and network authentication. Four network keys can be defined although only one can be used at any one time. Use the Current Network Key list box to select the appropriate network key.

Security options include authentication and encryption services based on the wired equivalent privacy (WEP) algorithm. WEP is a set of security services used to protect 802.11 networks from unauthorized access, such as eavesdropping; in this case, the capture of wireless network traffic. When data encryption is enabled, secret shared encryption keys are generated and used by the source station and the destination station to alter frame bits, thus avoiding disclosure to eavesdroppers.

Under shared key authentication, each wireless station is assumed to have received a secret shared key over a secure channel that is independent from the 802.11 wireless network communications channel.

Encryption Strength

This drop-down list box will display when WEP Encryption is enabled. The key strength is proportional to the number of binary bits comprising the key. This means that keys with a greater number of bits have a greater degree of security and are considerably more difficult to crack. Encryption strength can be set to either 64-bit or 128-bit. A 64-bit key is equivalent to 5 ASCII characters or 10 hexadecimal numbers. A 128-bit key contains 13 ASCII characters or 26

hexadecimal numbers. Each key contains a 24-bit header (an initiation vector) which enables parallel decoding of multiple streams of encrypted data.

6.2.1 WPS

Wi-Fi Protected Setup (WPS) is an industry standard that simplifies wireless security setup for certified network devices. Every WPS certified device has both a PIN number and a push button, located on the device or accessed through device software. The VI-3223u has both a WPS button on the device and a virtual button accessible from the web user interface (WUI).

Devices with the WPS logo (shown here) support WPS. If the WPS logo is not present on your device it still may support WPS, in this case, check the device documentation for the phrase "Wi-Fi Protected Setup".

NOTE:	WPS is only available in Open, WPA-PSK, WPA2-PSK and Mixed WPA2/WPA-PSK network authentication modes. Other authentication modes do not use WPS so they must be configured manually.

To configure security settings with WPS, follow the procedures below. You must choose either the Push-Button or PIN configuration method for Steps 6 and 7.

I. Setup

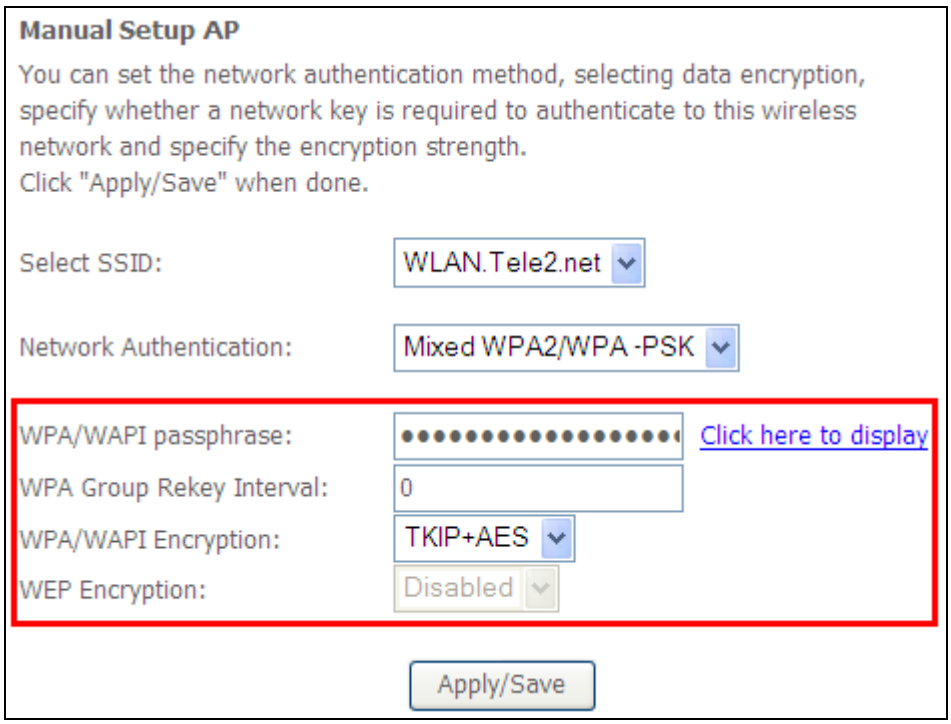
Step 1: Enable WPS by selecting **Enabled** from the drop down list box shown.

Step 2: Set the WPS AP Mode. **Configured** is used when the VI-3223u will assign security settings to clients. **Unconfigured** is used when an external client assigns security settings to the VI-3223u.

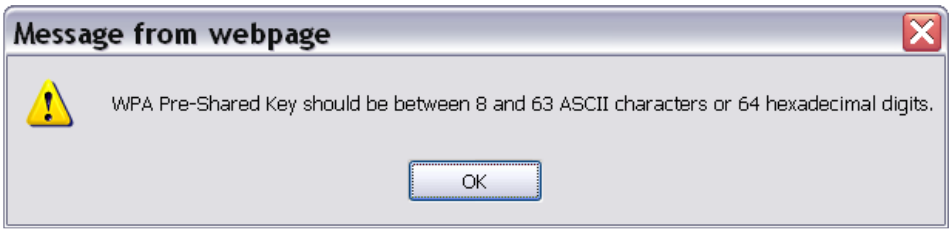
NOTES:	Your client may or may not have the ability to provide security settings to the VI-3223u. If it does not, then you must set the WPS AP mode to Configured. Consult the device documentation to check its capabilities. In addition, using Windows Vista, you can add an external registrar using the **StartAddER** button (Appendix E - WPS External Registrar has detailed instructions).

II. NETWORK AUTHENTICATION

Step 3: Select Open, WPA-PSK, WPA2-PSK, or Mixed WPA2/WPA-PSK network authentication mode from the Manual Setup AP section of the Wireless Security screen. The example below shows WPA2-PSK mode.



Step 4: For the Pre-Shared Key (PSK) modes, enter a WPA Pre-Shared Key. You will see the following dialog box if the Key is too short or too long.



Step 5: Click the **Apply/Save** button at the bottom of the screen.

IIIa. PUSH-BUTTON CONFIGURATION

The WPS push-button configuration provides a semi-automated configuration method. The WPS button on the rear panel of the router can be used for this purpose or the Web User Interface (WUI) can be used exclusively.

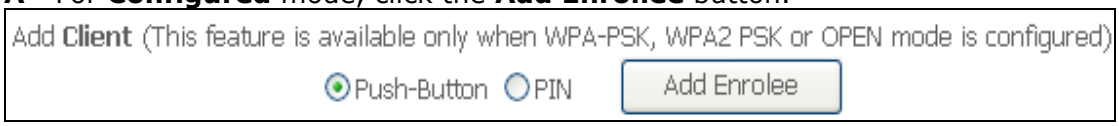
The WPS push-button configuration is described in the procedure below. It is assumed that the Wireless function is Enabled and that the router is configured as the Wireless Access Point (AP) of your WLAN. In addition, the wireless client must also be configured correctly and turned on, with WPS function enabled.

NOTE:	The wireless AP on the router searches for 2 minutes. If the router stops searching before you complete Step 7, return to Step 6.

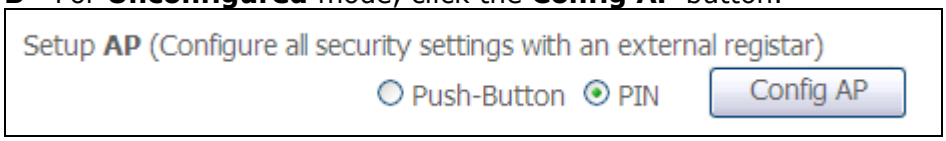
Step 6: **First method: WPS button**
Press the WPS button on the rear panel of the router. The WPS LED will blink to show that the router has begun searching for the client.

Second method: WUI virtual button
Select the Push-Button radio button in the WSC Setup section of the Wireless Security screen, as shown in **A** or **B** below, and then click the appropriate button based on the WSC AP mode selected in step 2.

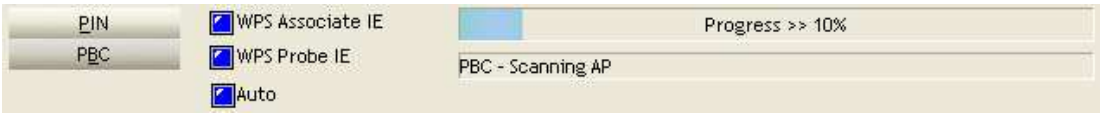
A - For **Configured** mode, click the **Add Enrollee** button.



B - For **Unconfigured** mode, click the **Config AP** button.



Step 7: Go to your WPS wireless client and activate the push-button function. A typical WPS client screenshot is shown below as an example.



Now go to Step 8 (part IV. Check Connection) to check the WPS connection.

IIIb. WPS – PIN CONFIGURATION

Using this method, security settings are configured with a personal identification number (PIN). The PIN can be found on the device itself or within the software. The PIN may be generated randomly in the latter case. To obtain a PIN number for your client, check the device documentation for specific instructions.

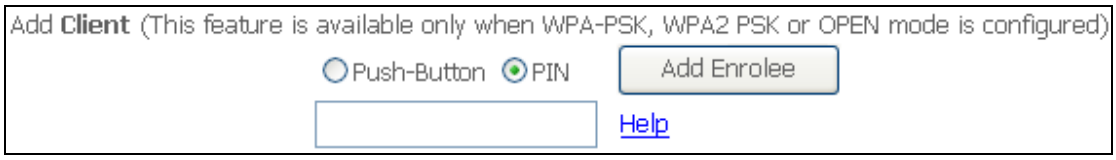
The WPS PIN configuration is described in the procedure below. It is assumed that the Wireless function is Enabled and that the router is configured as the Wireless Access Point (AP) of your wireless LAN. In addition, the wireless client must also be configured correctly and turned on, with WPS function enabled.

NOTE:	Unlike the push-button method, the pin method has no set time limit. This means that the router will continue searching until it finds a client.

Step 6: Select the PIN radio button in the WSC Setup section of the Wireless Security screen, as shown in **A** or **B** below, and then click the appropriate button based on the WSC AP mode selected in step 2.

A - For **Configured** mode, enter the client PIN in the box provided and

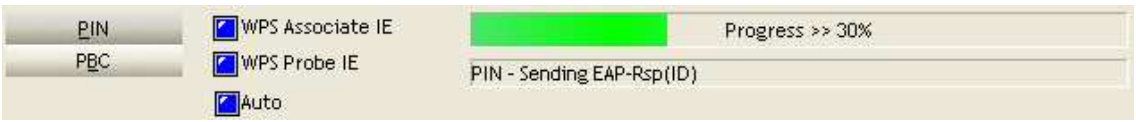
then click the **Add Enrollee** button (see below).


Add Client (This feature is available only when WPA-PSK, WPA2 PSK or OPEN mode is configured)
Push-Button
PIN
Add Enrolee
Help

B - For **Unconfigured** mode, click the **Config AP** button.

Step 7: Activate the PIN function on the wireless client. For **Configured** mode, the client must be configured as an Enrollee. For **Unconfigured** mode, the client must be configured as the Registrar. This is different from the External Registrar function provided in Windows Vista.

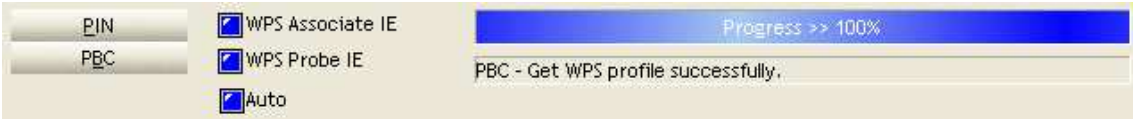
The figure below provides an example of a WPS client PIN function in-progress.



Now go to Step 8 (part IV. Check Connection) to check the WPS connection.

IV. CHECK CONNECTION

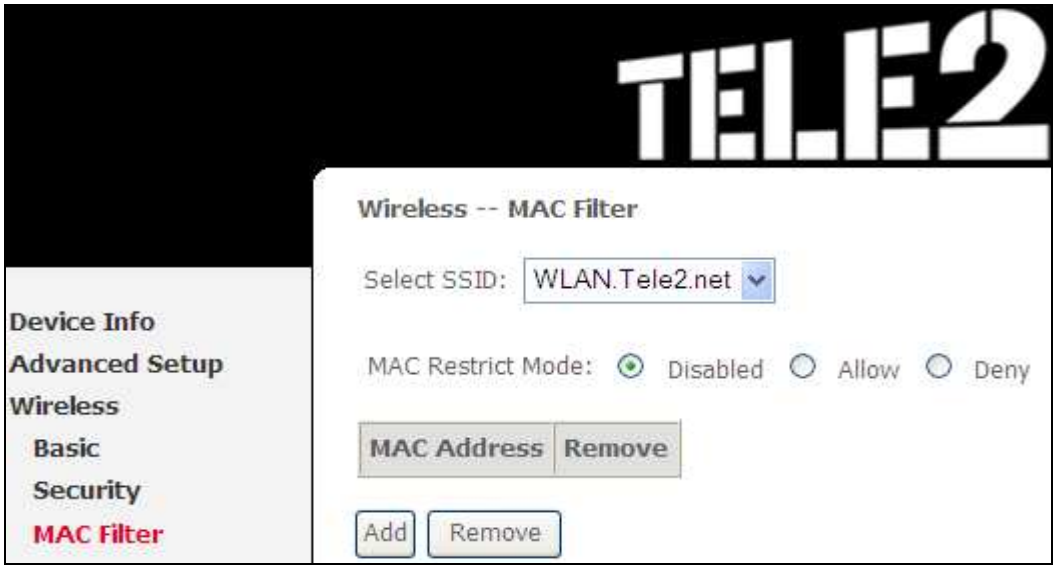
Step 8: If the WPS setup method was successful, you will be able access the wireless AP from the client. The client software should show the status. The example below shows that the connection established successfully.



You can also double-click the Wireless Network Connection icon from the Network Connections window (or the system tray) to confirm the status of the new connection.

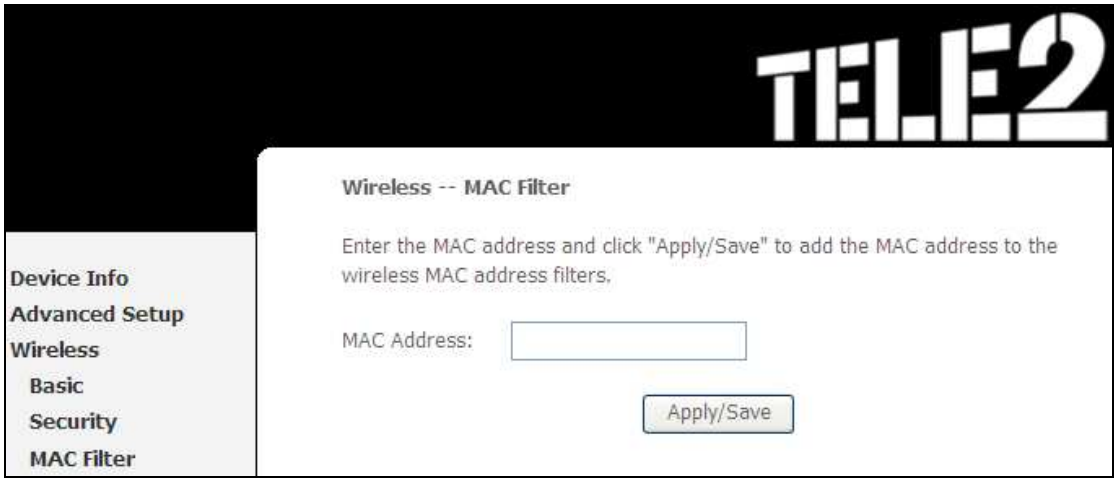
6.3 MAC Filter

This option allows access to the router to be restricted based upon MAC addresses. To add a MAC Address filter, click the **Add** button shown below. To delete a filter, select it from the MAC Address table below and click the **Remove** button.



Option	Description
Select SSID	Select the wireless network name from the drop-down box. SSID stands for Service Set Identifier. All stations must be configured with the correct SSID to access the WLAN. If the SSID does not match, that user will not be granted access.
MAC Restrict Mode	Disabled: MAC filtering is disabled. Allow: Permits access for the specified MAC addresses. Deny: Rejects access for the specified MAC addresses.
MAC Address	Lists the MAC addresses subject to the MAC Restrict Mode. A maximum of 60 MAC addresses can be added. Every network device has a unique 48-bit MAC address. This is usually shown as xx.xx.xx.xx.xx.xx, where xx are hexadecimal numbers.

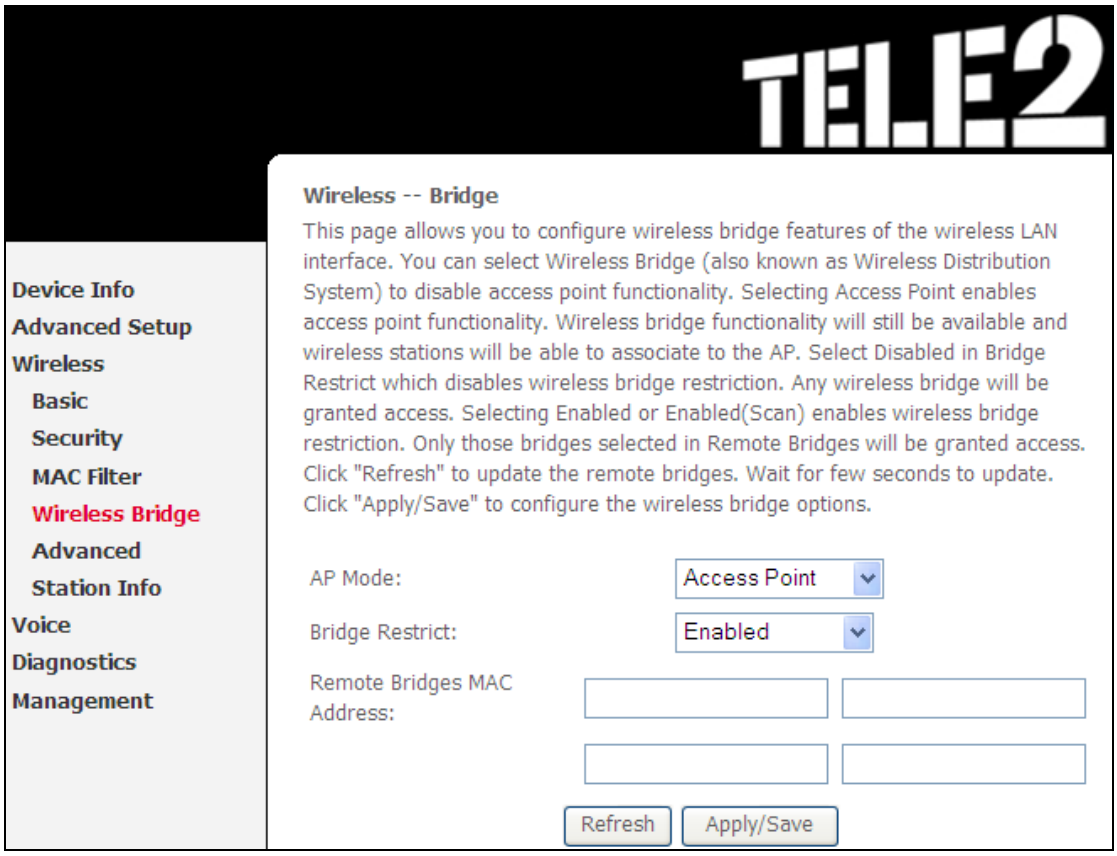
After clicking the **Add** button, the screen below appears.



Input the MAC address in the box provided and click **Apply/Save**.

6.4 Wireless Bridge

This screen allows for the configuration of wireless bridge features of the WLAN interface. See the table beneath for detailed explanations of the various options.

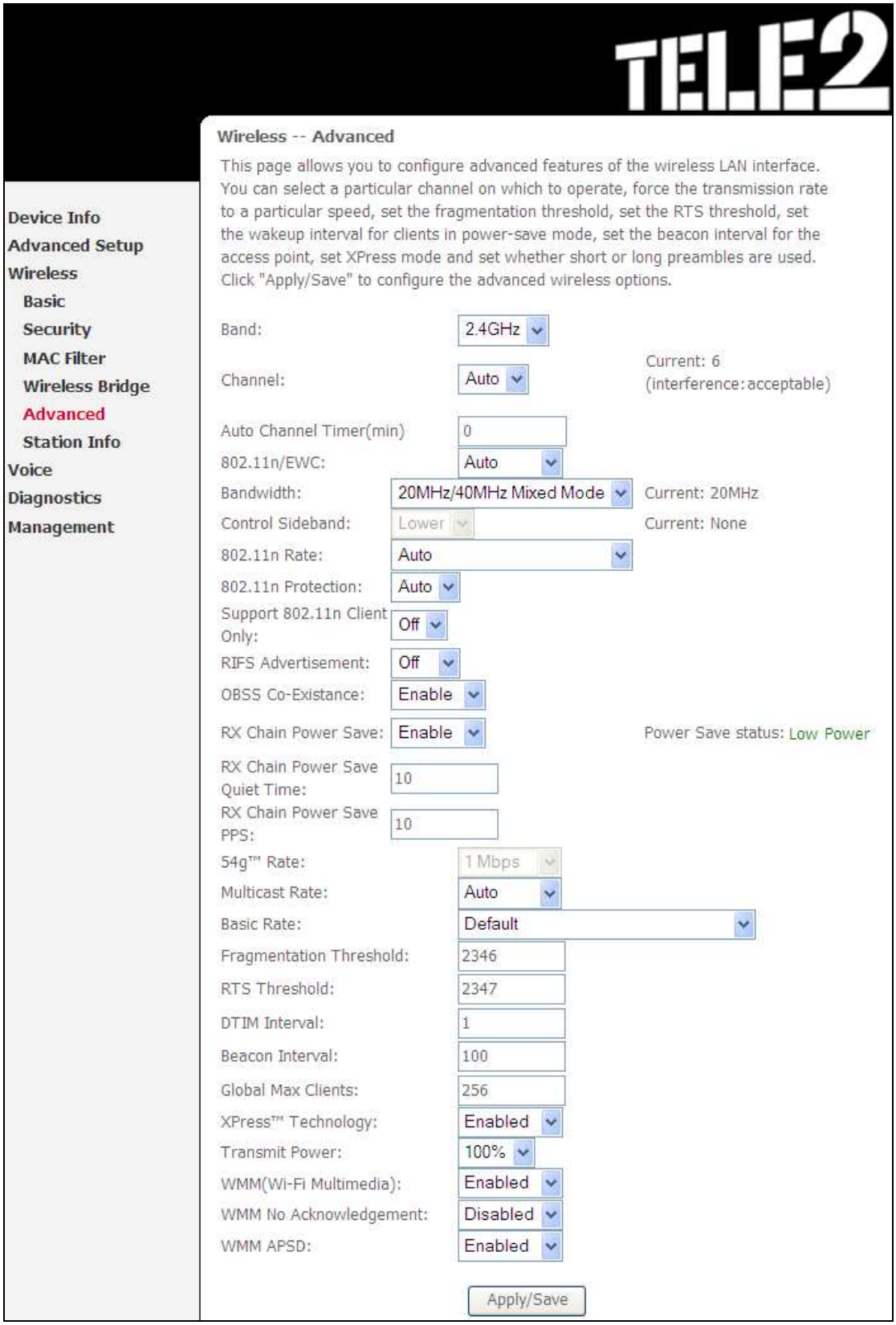

Device Info
Advanced Setup
Wireless
Basic
Security
MAC Filter
Wireless Bridge
Advanced
Station Info
Voice
Diagnostics
Management
Wireless -- Bridge
This page allows you to configure wireless bridge features of the wireless LAN interface. You can select Wireless Bridge (also known as Wireless Distribution System) to disable access point functionality. Selecting Access Point enables access point functionality. Wireless bridge functionality will still be available and wireless stations will be able to associate to the AP. Select Disabled in Bridge Restrict which disables wireless bridge restriction. Any wireless bridge will be granted access. Selecting Enabled or Enabled(Scan) enables wireless bridge restriction. Only those bridges selected in Remote Bridges will be granted access. Click "Refresh" to update the remote bridges. Wait for few seconds to update. Click "Apply/Save" to configure the wireless bridge options.
AP Mode:
Access Point
Bridge Restrict:
Enabled
Remote Bridges MAC Address:
Refresh
Apply/Save

Click **Apply/Save** to implement new configuration settings.

Feature	Description
AP Mode	Selecting **Wireless Bridge** (aka Wireless Distribution System) disables Access Point (AP) functionality, while selecting **Access Point** enables AP functionality. In **Access Point** mode, wireless bridge functionality will still be available and wireless stations will be able to associate to the AP.
Bridge Restrict	Selecting **Disabled** disables wireless bridge restriction, which means that any wireless bridge will be granted access. Selecting **Enabled** or **Enabled (Scan)** enables wireless bridge restriction. Only those bridges selected in the Remote Bridges list will be granted access. Click **Refresh** to update the station list when Bridge Restrict is enabled.

6.5 Advanced

The Advanced screen allows you to configure advanced features of the wireless LAN interface. You can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used.


Device Info
Advanced Setup
Wireless
Basic
Security
MAC Filter
Wireless Bridge
Advanced
Station Info
Voice
Diagnostics
Management
Wireless -- Advanced
This page allows you to configure advanced features of the wireless LAN interface. You can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used. Click "Apply/Save" to configure the advanced wireless options.
Band: 2.4GHz
Channel: Auto
Current: 6 (interference:acceptable)
Auto Channel Timer(min) 0
802.11n/EWC: Auto
Bandwidth: 20MHz/40MHz Mixed Mode
Current: 20MHz
Control Sideband: Lower
Current: None
802.11n Rate: Auto
802.11n Protection: Auto
Support 802.11n Client Only: Off
RIFS Advertisement: Off
OBSS Co-Existance: Enable
RX Chain Power Save: Enable
Power Save status: Low Power
RX Chain Power Save Quiet Time: 10
RX Chain Power Save PPS: 10
54g™ Rate: 1 Mbps
Multicast Rate: Auto
Basic Rate: Default
Fragmentation Threshold: 2346
RTS Threshold: 2347
DTIM Interval: 1
Beacon Interval: 100
Global Max Clients: 256
XPress™ Technology: Enabled
Transmit Power: 100%
WMM(Wi-Fi Multimedia): Enabled
WMM No Acknowledgement: Disabled
WMM APSD: Enabled
Apply/Save

Click **Apply/Save** to set new advanced wireless options.

Field	Description
Band	Set to 2.4 GHz for compatibility with IEEE 802.11x standards. The new amendment allows IEEE 802.11n units to fall back to slower speeds so that legacy IEEE 802.11x devices can coexist in the same network. IEEE 802.11g creates data-rate parity at 2.4 GHz with the IEEE 802.11a standard, which has a 54 Mbps rate at 5 GHz. (IEEE 802.11a has other differences compared to IEEE 802.11b or g, such as offering more channels.)
Channel	Drop-down menu that allows selection of a specific channel.
Auto Channel Timer (min)	Auto channel scan timer in minutes (0 to disable)
802.11n/EWC	An equipment interoperability standard setting based on IEEE 802.11n Draft 2.0 and Enhanced Wireless Consortium (EWC)
Bandwidth	Select 20GHz or 40GHz bandwidth. 40GHz bandwidth uses two adjacent 20GHz bands for increased data throughput.
Control Sideband	Select Upper or Lower sideband when in 40GHz mode.
802.11n Rate	Set the physical transmission rate (PHY).
802.11n Protection	Turn Off for maximized throughput. Turn On for greater security.
Support 802.11n Client Only	Turn Off to allow 802.11b/g clients access to the router. Turn On to prohibit 802.11b/g clients access to the router.
RIFS Advertisement	Reduced Interframe Space is the creation of a short time delay between PDUs to improve wireless efficiency.
OBSS Co-Existence	Co-existence between 20 MHZ AND 40 MHZ overlapping Basic Service Set (OBSS) in WLAN.
RX Chain Power Save	Enabling this feature turns off one of the Receive chains, going from 2x2 to 2x1 to save power.
RX Chain Power Save Quiet Time	The number of seconds the traffic must be below the PPS value below before the Rx Chain Power Save feature activates itself.
RX Chain Power Save PPS	The maximum number of packets per seconds that can be processed by the WLAN interface for a duration of Quiet Time, described above, before the Rx Chain Power Save feature activates itself.
54g Rate	Drop-down menu that specifies the following fixed rates: Auto: Default. Uses the 11 Mbps data rate when possible but drops to lower rates when necessary. 1 Mbps, 2Mbps, 5.5Mbps, or 11Mbps fixed rates. The appropriate setting is dependent on signal strength.
Multicast Rate	Setting for multicast packet transmit rate (1-54 Mbps)
Basic Rate	Setting for basic transmission rate.

Field	Description
Fragmentation Threshold	A threshold, specified in bytes, that determines whether packets will be fragmented and at what size. On an 802.11 WLAN, packets that exceed the fragmentation threshold are fragmented, i.e., split into, smaller units suitable for the circuit size. Packets smaller than the specified fragmentation threshold value are not fragmented. Enter a value between 256 and 2346. If you experience a high packet error rate, try to slightly increase your Fragmentation Threshold. The value should remain at its default setting of 2346. Setting the Fragmentation Threshold too low may result in poor performance.
RTS Threshold	Request to Send, when set in bytes, specifies the packet size beyond which the WLAN Card invokes its RTS/CTS mechanism. Packets that exceed the specified RTS threshold trigger the RTS/CTS mechanism. The NIC transmits smaller packet without using RTS/CTS. The default setting of 2347 (maximum length) disables RTS Threshold.
DTIM Interval	Delivery Traffic Indication Message (DTIM) is also known as Beacon Rate. The entry range is a value between 1 and 65535. A DTIM is a countdown variable that informs clients of the next window for listening to broadcast and multicast messages. When the AP has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. AP Clients hear the beacons and awaken to receive the broadcast and multicast messages. The default is 1.
Beacon Interval	The amount of time between beacon transmissions in milliseconds. The default is 100 ms and the acceptable range is 1 – 65535. The beacon transmissions identify the presence of an access point. By default, network devices passively scan all RF channels listening for beacons coming from access points. Before a station enters power save mode, the station needs the beacon interval to know when to wake up to receive the beacon (and learn whether there are buffered frames at the access point).
Global Max Clients	The maximum number of clients that can connect to the router.
Xpress ™ Technology	Xpress Technology is compliant with draft specifications of two planned wireless industry standards.
Transmit Power	Set the power output (by percentage) as desired.
WMM (Wi-Fi Multimedia)	The technology maintains the priority of audio, video and voice applications in a Wi-Fi network. It allows multimedia service get higher priority.
WMM No Acknowledgement	Refers to the acknowledge policy used at the MAC level. Enabling no Acknowledgement can result in more efficient throughput but higher error rates in a noisy Radio Frequency (RF) environment.
WMM APSD	This is Automatic Power Save Delivery. It saves power.

6.6 Station Info

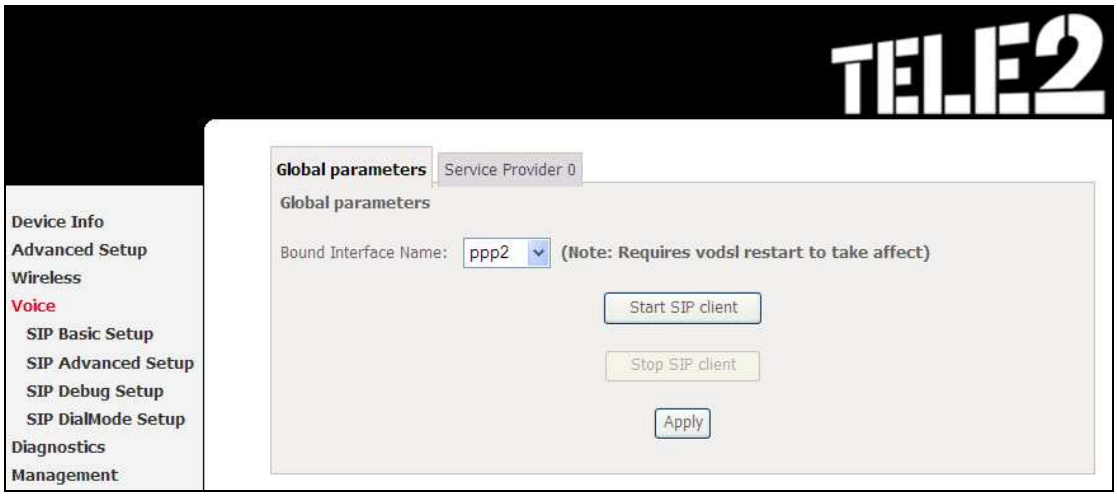
This page shows authenticated wireless stations and their status. Click the **Refresh** button to update the list of stations in the WLAN.

Consult the table below for descriptions of each column heading.

Heading	Description
MAC	Lists the MAC address of all the stations.
Associated	Lists all the stations that are associated with the Access Point, along with the amount of time since packets were transferred to and from each station. If a station is idle for too long, it is removed from this list.
Authorized	Lists those devices with authorized access.
SSID	Lists which SSID of the modem that the stations connect to.
Interface	Lists which interface of the modem that the stations connect to.

Chapter 7 Voice

This chapter first describes the various options for configuration of the SIP voice service. It then provides detailed instructions for making telephone calls using VoIP (Voice over IP) or PSTN (Public Switched Telephone Network) services.
Session Initiation Protocol (SIP) is a peer-to-peer protocol used for Internet conferencing, telephony, events notification, presence and instant messaging.
SIP is designed to address the functions of signaling and session management within a packet telephony network. Signaling allows call information to be carried across network boundaries. Session management provides the ability to control the attributes of an end-to-end call.



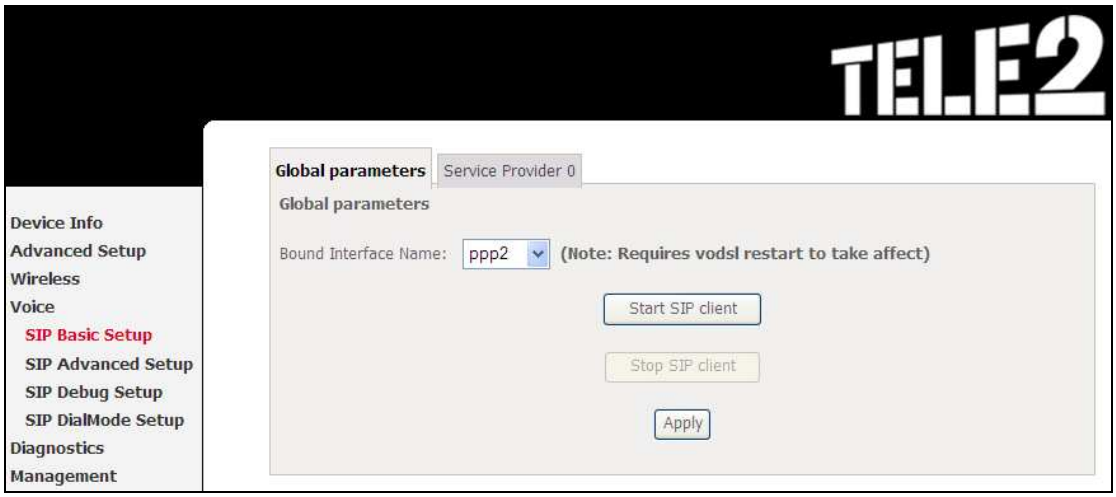
NOTE: The SIP standard is set by the Internet Engineering Task Force (IETF).

The SIP standard defines the following agents/servers:

- User Agents (**UA**) - SIP phone clients (hardware or software)
- Proxy Server – relays data between **UA** and external servers
- Registrar Server - a server that accepts register requests from **UA**
- Redirect Server – provides an address lookup service to **UA**

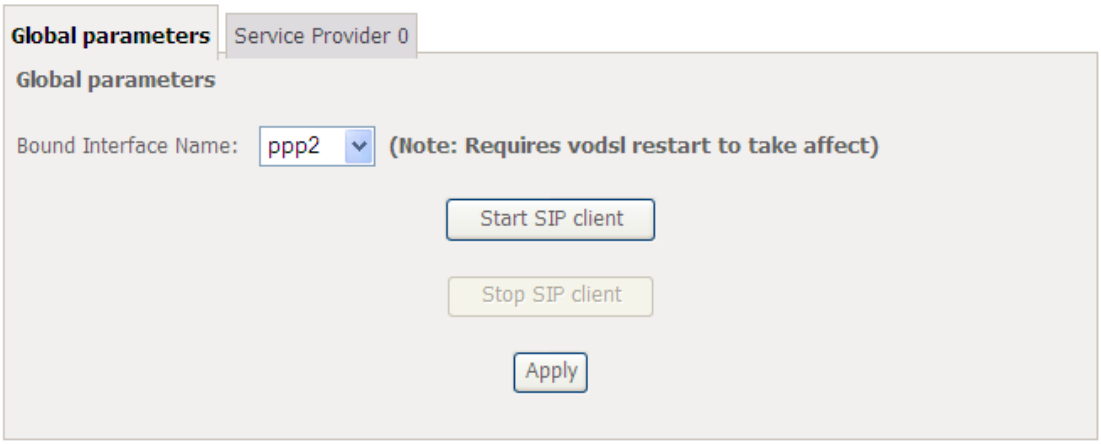
The following subsections present **Basic**, **Advanced** and **Debug** SIP screens. Each screen provides various options for customizing the SIP configuration.

7.1 SIP Basic Setting



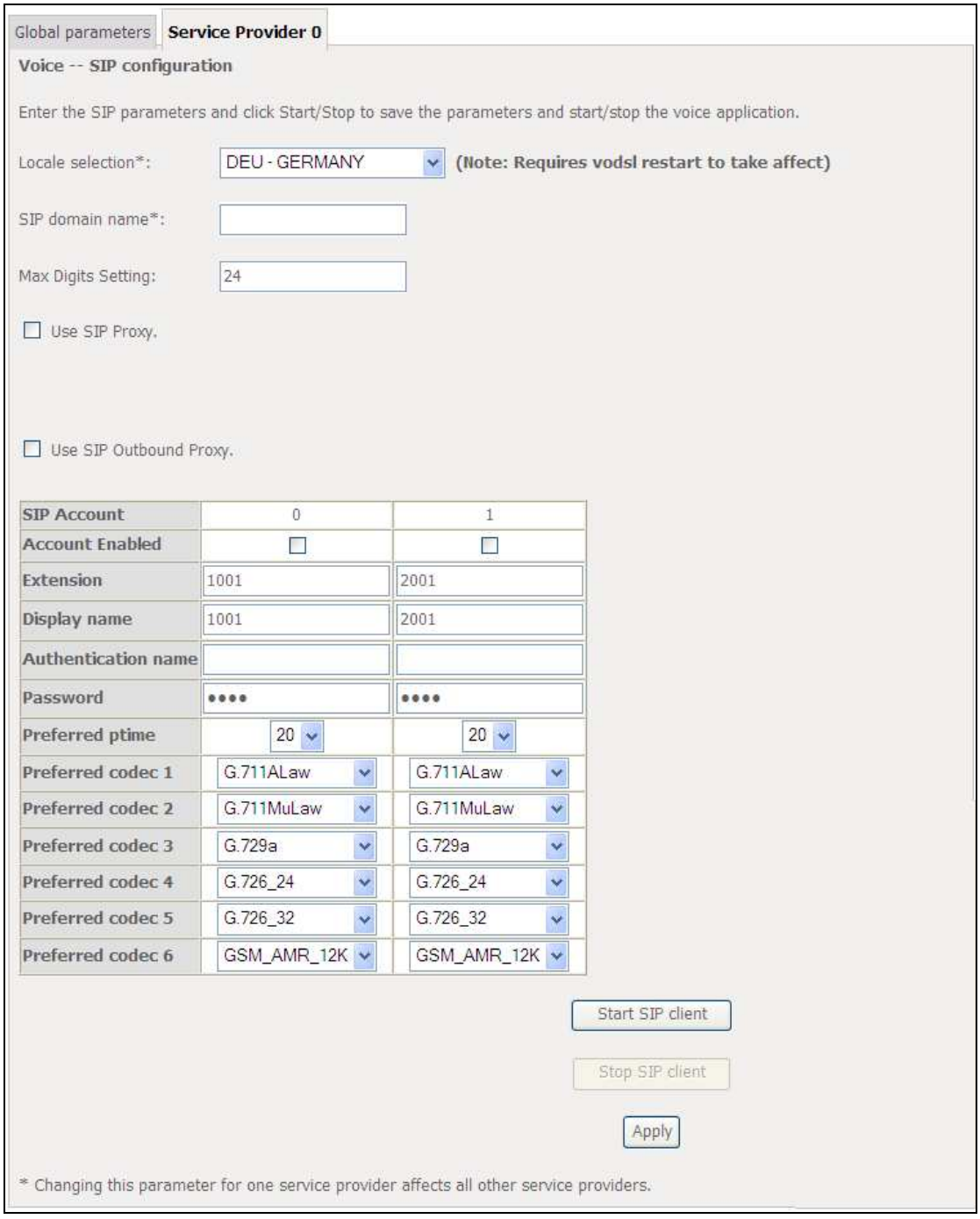
7.1.1 Global Parameters

A common parameter setting.



7.1.2 Service Provider

This screen contains basic SIP configuration settings.

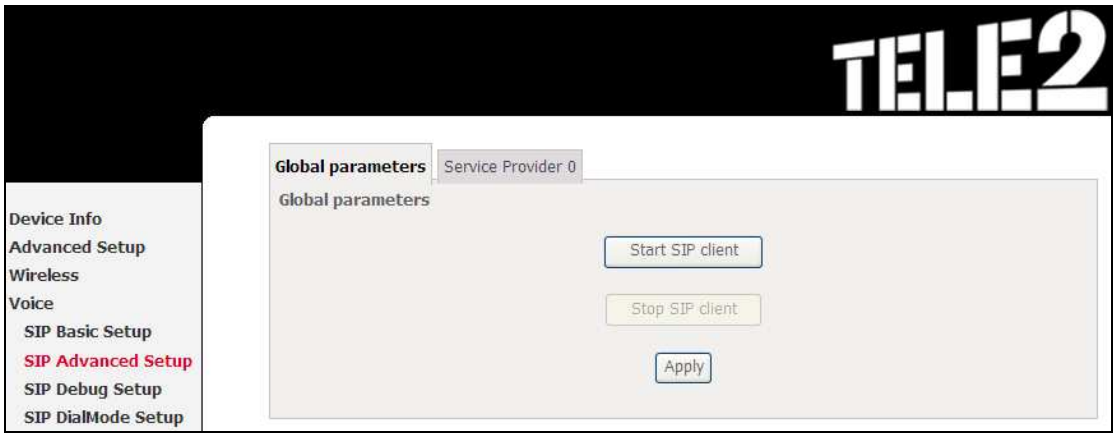


Once settings are configured click **Save** and **Apply** to begin using the service.

Field	Description
Locale Selection	Sets tone, ring type and physical characteristics for specific countries.
SIP domain name	Provided by your VoIP provider.
Max Digits Setting	Provides the maximum numbers that can be dialed.
Use SIP proxy	Enable the SIP proxy by selecting the checkbox ☑ and setting proxy parameters.
SIP Proxy	Input IP address or domain name of the SIP proxy server, used for VOIP service.
SIP Proxy port	This value is set by your VoIP provider.
Use SIP Outbound Proxy	Enable the SIP outbound proxy by selecting the checkbox ☑ and setting outbound proxy parameters. It forwards the requests if you cannot reach SIP proxy directly.
Use SIP outbound proxy	Select if required by your VoIP provider. Input SIP Outbound Proxy IP and port.
SIP Outbound Proxy	Input SIP Outbound Proxy IP if required.
SIP Outbound Proxy port	Input SIP Outbound Proxy port number if required.
FYI: *A proxy is an intermediary program that acts as both a server and a client for the purpose of making requests on behalf of other clients. Requests are serviced internally or transferred to other servers. A proxy interprets and, if necessary, rewrites a request message before forwarding it.*	
SIP Account 1 & 2	**Ports FXS1 & FXS2**
SIP Account	Map SIP accounts to physical ports. "0" represents to FXS1 and "1" represents to FXS2.
Extension	The line extension number
Display Name	The caller ID display name
Authentication Name	The authentication username for the Registrar/Proxy, given by VOIP provider.
Authentication Password	The authentication password for the Registrar/proxy, given by VOIP provider.
Preferred ptime	The time period used to digitally sample the analog voice signal. The default is 20 ms.
Preferred codec 1-6	Choose from G.711MuLaw/ALaw, G.729a, G.723.1, G.726_24/32, or GSM_AMR codecs

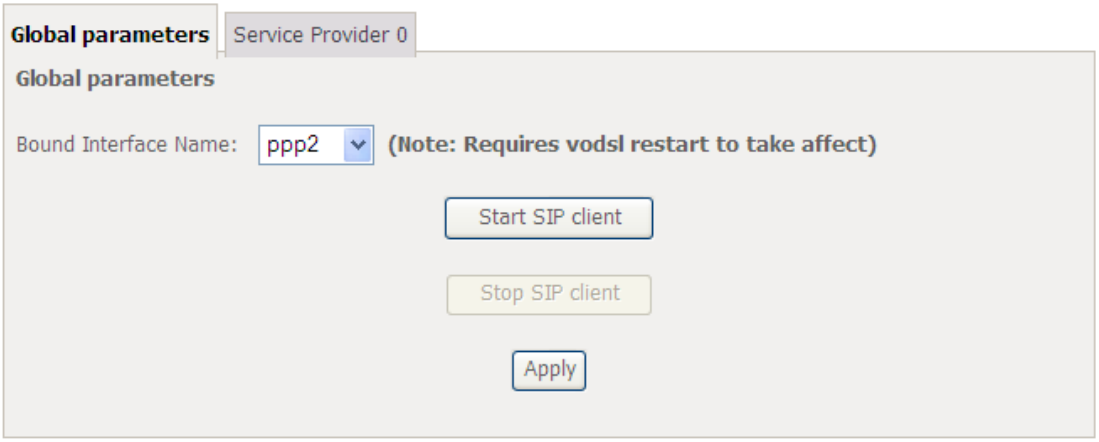
7.2 SIP Advanced

This screen contains the advanced SIP configuration settings.



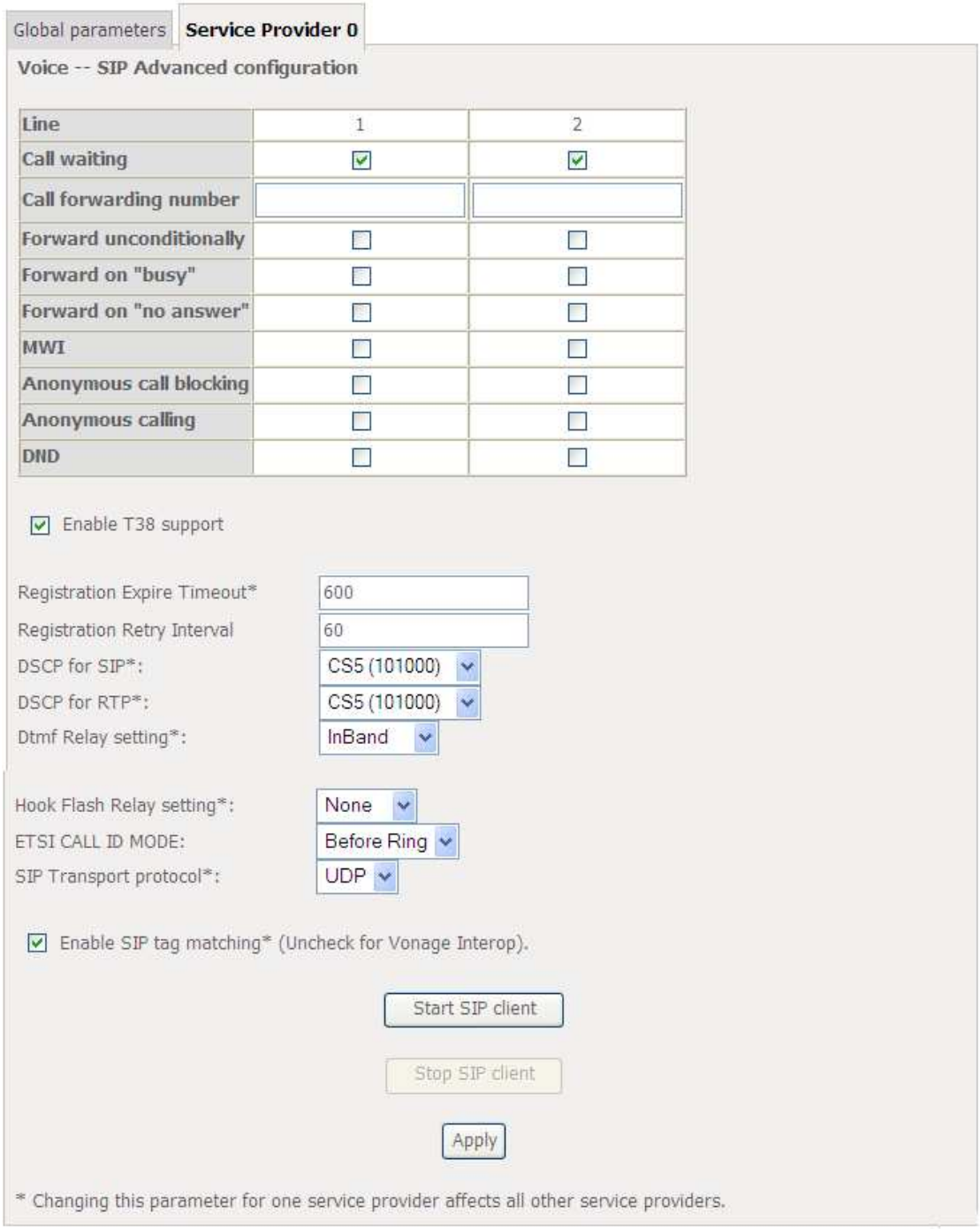
7.2.1 Global Parameters

A common parameter setting.



7.2.2 Service Provider

Configure your settings based on your service provider.



These settings are described in the tables below. Once configuration is complete, click **Save** and **Apply** to begin using the service.

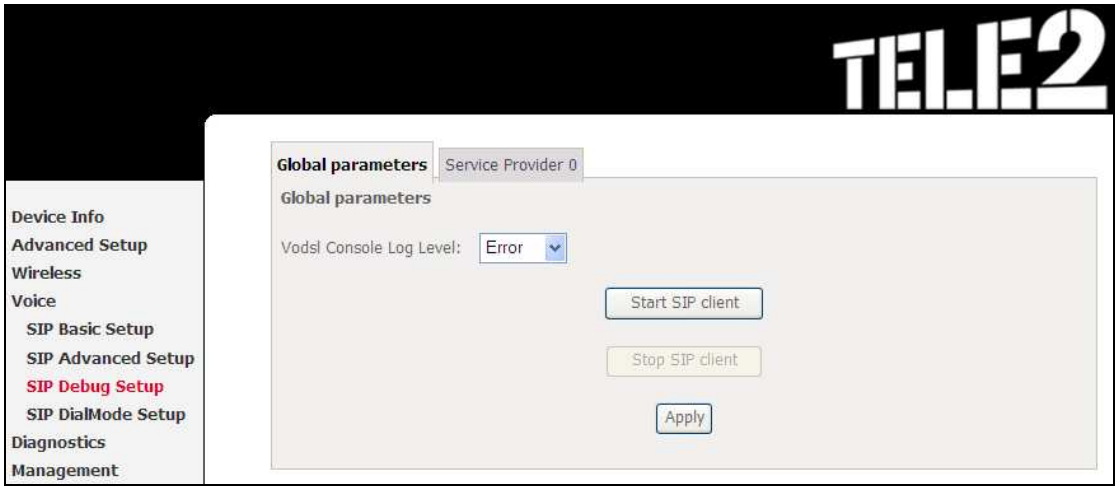
NOTE:	Some of these options can also be set using telephone keypad commands, as described in the call command list in section 7.2 Telephone Calls.

Line 1 & 2	Ports FXS1 & FXS2
Call waiting	Tick the checkbox ☑ to enable this option
Call forwarding number	Enter the forwarding phone number
Forward unconditionally	Tick the checkbox ☑ to enable this option
Forward on "busy"	Tick the checkbox ☑ to enable this option
Forward on "no answer"	Tick the checkbox ☑ to enable this option
MWI	Enable or disable Message-Waiting Indicator (MWI) for FXS Phones with this checkbox ☑.
Anonymous call blocking	Tick the checkbox ☑ to enable this option
Anonymous calling	Tick the checkbox ☑ to enable this option
DND (Do Not Disturb)	Tick the checkbox ☑ to enable this option

Enable T.38 support	Enable or disable T.38 Fax mode support with this checkbox ☑. You can plug a fax machine into either phone port to send or receive faxes. Functionality depends upon FAX support by your VoIP service provider.
Registration Expire Timeout	The time period the user would like the registration to be valid for the Registrar/ Proxy Server. The default is 3600 seconds.
Registration Retry Interval	The time interval between re-registration attempts.
Max Digit Length	Sets the maximum number of digits for a phone number.
DSCP for SIP	Diff Serv Code Point (DSCP) for SIP
DSCP for RTP	Diff Serv Code Point (DSCP) for RTP
Dtmf Relay setting	Set the special use of RTP packets to transmit digit events.
Hook Flash Relay setting	Set flash hook event will be sent via which signal.
SIP Transport protocol	SIP control message will be sent via which protocol.
Enable SIP tag matching (Uncheck for Vonage Interop).	Since CPE rely on the tags for matching purposes, implementations which support Replacements MUST support the SIP specification, which requires tags.

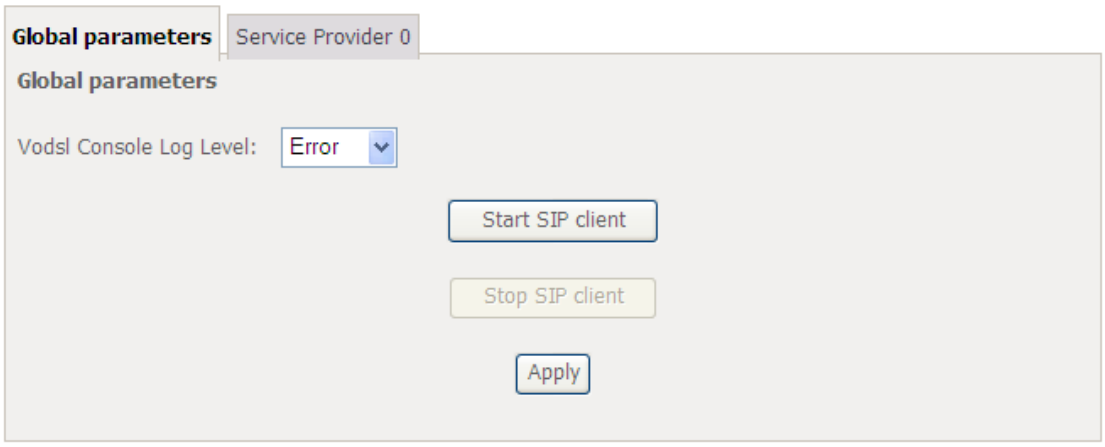
7.3 SIP Debug

This screen contains SIP configuration settings used for debugging.



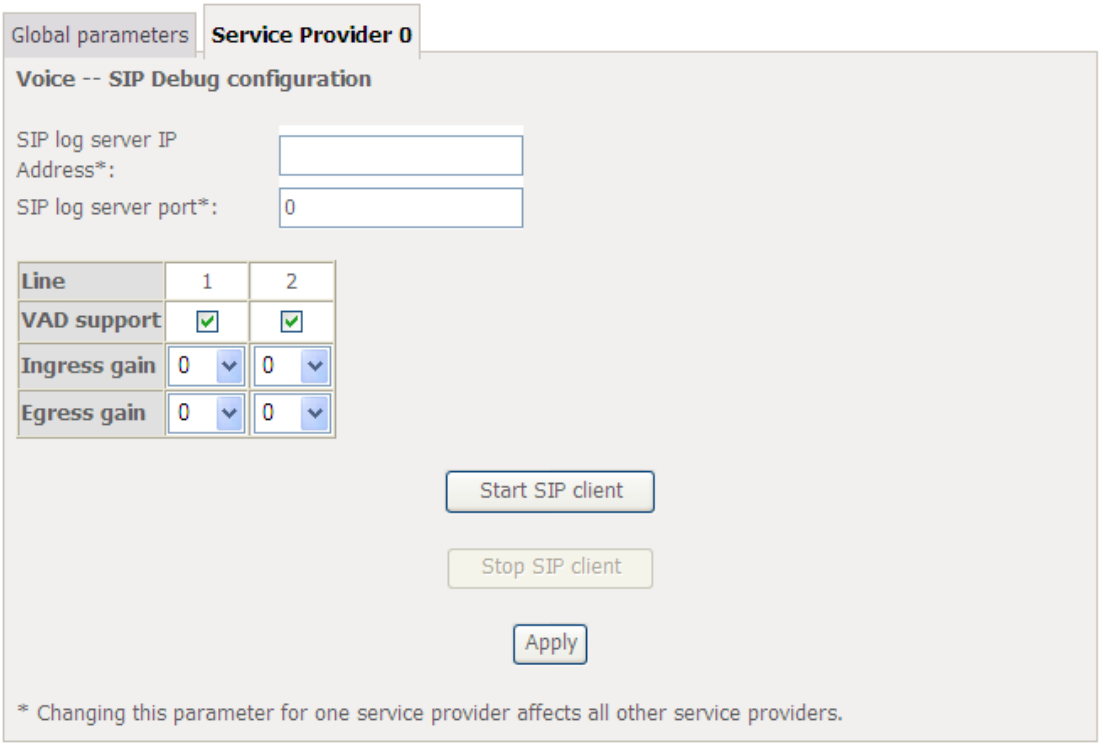
7.3.1 Global Parameters

A common parameter setting.



7.3.2 Service Provider

Configure your settings based on your service provider.



Once settings are configured click **Save** and **Apply** to begin using the service.

Checkbox ☑	**Description**
SIP log server IP address & port	Enter the IP address and port of the SIP log server.
Enable Vad Support	Select the checkbox ☑ to enable VAD support. Adjust the volume for incoming (Ingress) or outgoing (Egress) gain with the drop-down boxes.
Ingress gain	Enhances the volume of speaking (the volume heard from the other side).
Egress gain	Enhances the volume of hearing.

7.4 Telephone Calls

To make a call, simply dial the number. The dial plan (i.e. the dialed digits) is normally customized for each installation. The default dial plan allows for dialing of 24-digit extensions or direct IP addresses. For shorter extension numbers (e.g. 3-digits) adding a "#" at the end.

When a Call Server (SIP Proxy Server) is configured into the system, the dialed digits are translated and routed by the Call Server to the correct destination as registered with the Call Server.

If no Call Server is configured, calls can still be made using 4-digit extensions, rather than using full IP addresses. The originator translates the dialed-digits to a destination device as follows:

First Digit:	Line identifier (for multi-line gateways)
Remaining digits:	Host number part of an IP address. The Network number part is considered to be the same as the caller's IP address.

For example, if a caller at address 10.136.64.33/24 dials "2023", the call will be placed to the second line at address 10.136.64.23. All devices have to be on the same Class C subnet (24-bit subnet mask).

To dial an IP address directly, dial the IP address digits using * on the keypad as the dot. Complete the address with a final * or #. When using IP address dialing it is not possible to specify which line at a gateway is called, so the gateway always routes IP-address dialed calls to the first line.

Network busy tone (fast busy) will be played for unknown or unreachable destinations. To answer a call, pick up the phone or press the hands free button.

Caller ID
The Call Manager delivers Calling Number when placing calls. The calling number is transmitted to the analog line for CLASS recognition.

Call Hold
To put a call on hold, press flash then hang up (optional). To return to the original call, press flash or pick up the phone. The phone will issue a short ring burst every 30 seconds or so while on-hook to remind you that a call is on hold.

Call Transfer
- To transfer a call, press flash then dial the new number.
- To transfer immediately, hang up (blind transfer).
- To transfer with consultation, wait for the party to answer, consult, and hang up.
- To abort the transfer (if the third party does not answer); press flash to return to the original call.

Conference Calling
To turn a two-party call into a three-party conference call, press flash and dial the third party. Wait for the party to answer, then press flash. To drop the third party and return to a two-party call, press flash again. To drop yourself out of the conference, hang up. The call will be transferred (so that the other two parties remain connected to each other). In conference mode, the conference initiator performs the audio bridge/mixing function – there are only two voice streams established.

Call Waiting
If call waiting is enabled on a line, and you hear the call waiting tone during a call, press flash to answer the second call. The first call is automatically placed on hold. To switch between calls, press flash again.

- To disable the call waiting feature, dial *60.
- To enable the call waiting feature, dial *61.

Call forward feature settings (Busy or All) takes priority over the call-waiting feature. The call-waiting feature is ignored on new incoming calls if there is already a call on hold or in conference.

Call Forward Number
- To set the call forward number, dial *74 then the number. Note that this does not actually enable forwarding; to do so, select the call forward action as described below.
- To disable all call forwarding features, dial *70

Call Forward No Answer
- To enable call forward on no answer, dial *71. Incoming calls will be forwarded if unanswered for 18 seconds.

Call Forward Busy
- To enable call forward if busy, dial *72. Incoming calls will be immediately forwarded if the phone is off-hook.

Call Forward All
- To enable call forward for all calls, dial *73.
- To disable the "forward all calls" feature, dial *75.

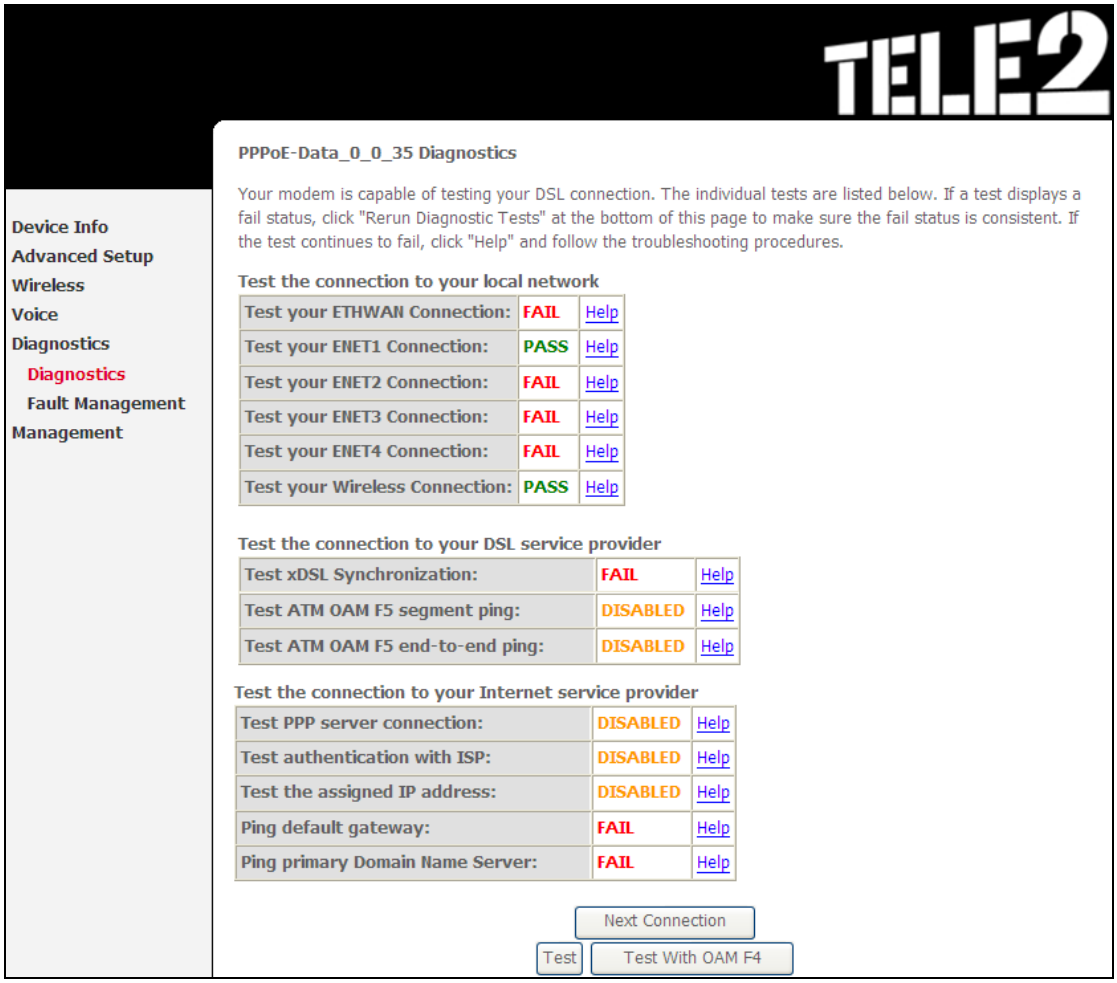
Previous settings for Call Forward Busy or No Answer are not modified.

Call Return
- To call the last known incoming caller (unanswered or not), dial *69.

Redial
- To redial the last outgoing number, dial *68.

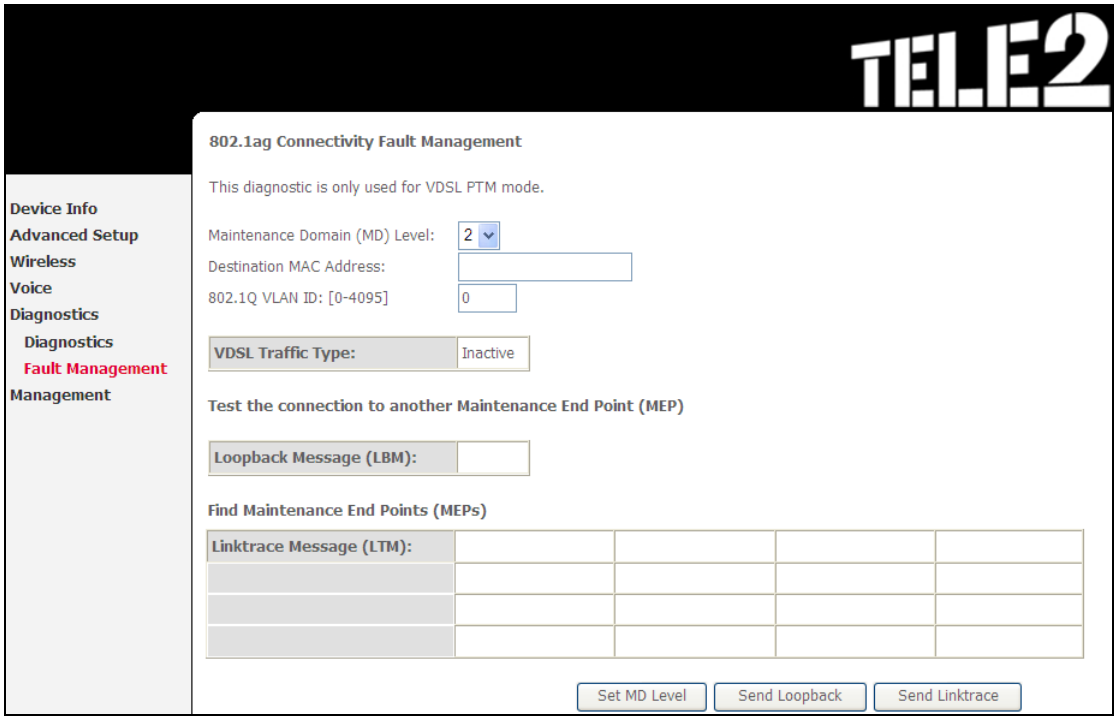
Chapter 8 Diagnostics

The first Diagnostics screen is a dashboard that shows overall connection status. If a test displays a fail status, click the button to retest and confirm the error. If a test continues to fail, click Help and follow the troubleshooting procedures.


TELE2
Device Info
Advanced Setup
Wireless
Voice
Diagnostics
Diagnostics
Fault Management
Management
PPPoE-Data_0_0_35 Diagnostics
Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.
Test the connection to your local network
Test your ETHWAN Connection: FAIL Help
Test your ENET1 Connection: PASS Help
Test your ENET2 Connection: FAIL Help
Test your ENET3 Connection: FAIL Help
Test your ENET4 Connection: FAIL Help
Test your Wireless Connection: PASS Help
Test the connection to your DSL service provider
Test xDSL Synchronization: FAIL Help
Test ATM OAM F5 segment ping: DISABLED Help
Test ATM OAM F5 end-to-end ping: DISABLED Help
Test the connection to your Internet service provider
Test PPP server connection: DISABLED Help
Test authentication with ISP: DISABLED Help
Test the assigned IP address: DISABLED Help
Ping default gateway: FAIL Help
Ping primary Domain Name Server: FAIL Help
Next Connection
Test
Test With OAM F4

8.1 Fault Management

IEEE 802.1ag Connectivity Fault Management (CFM) enabling service providers to detect, analyze and isolate faults in bridged LANs thus reducing support costs and improving service uptime.



Maintenance Domain (MD) Level:	Maintenance Domains are management space on a network, typically owned and operated by a single entity MD are configured with Names and Levels, where the eight levels range from 0 to 7
Destination MAC Address:	Multicast MAC @ (for Traceroute, Connectivity check) or unicast (for Loopback)
802.1Q VLAN ID: [0-4095]	802.1Q VLAN ID
VDSL Traffic Type:	ATM/PTM/Inactive
Loopback Message (LBM):	Loop-back messages otherwise known as MaC ping are Unicast frames that a MEP transmits, they are similar in concept to an Internet Control Message Protocol (ICMP) Echo (Ping) messages, sending Loopback to successive MIPs can determine the location of a fault. Sending a high volume of Loopback Messages can test bandwidth, reliability, or jitter of a service, which is similar to flood ping. A MEP can send a Loopback to any MEP or MIP in the service.unlike CCMs Loop back messages are administratively initiated and stopped.

Linktrace Message (LTM):	Link Trace messages otherwise known as Mac Trace Route are Multicast frames that a MEP transmits to track the path (hop-by-hop) to a destination MEP which is similar in concept to User Datagram Protocol (UDP) Trace Route. Each receiving MEP sends a Trace route Reply directly to the Originating MEP, and regenerates the Trace route Message

Click the **Set MD Level** button to apply/save the Maintenance Domain (MD) Level.

Click the **Send Loopback** button to test the connection to another Maintenance End Point (MEP).

Click the **Send Linktrace** button to Find Maintenance End Points (MEPs).

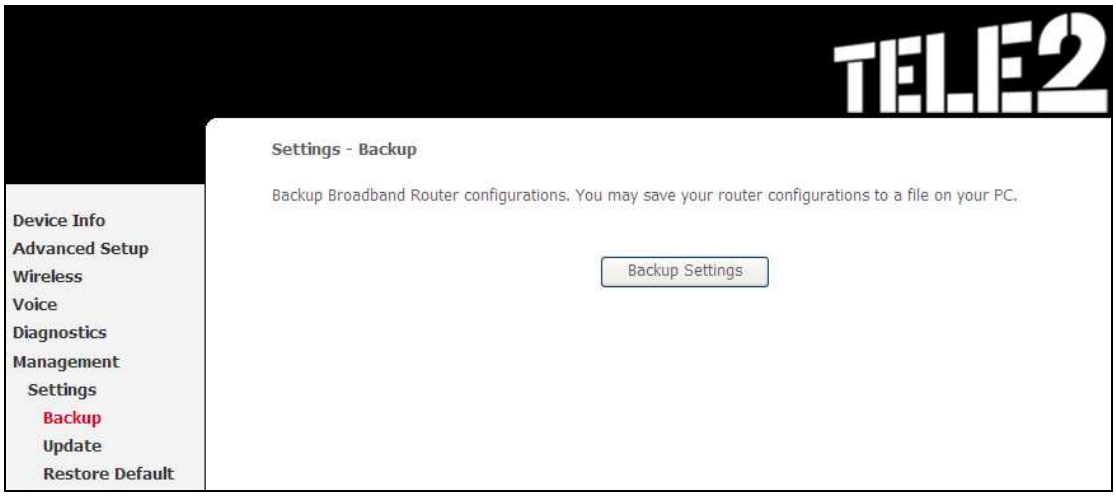
Chapter 9 Management

9.1 Settings

This includes 9.1.1 Backup Settings, 9.1.2 Update Settings, and 9.1.3 Restore Default screens.

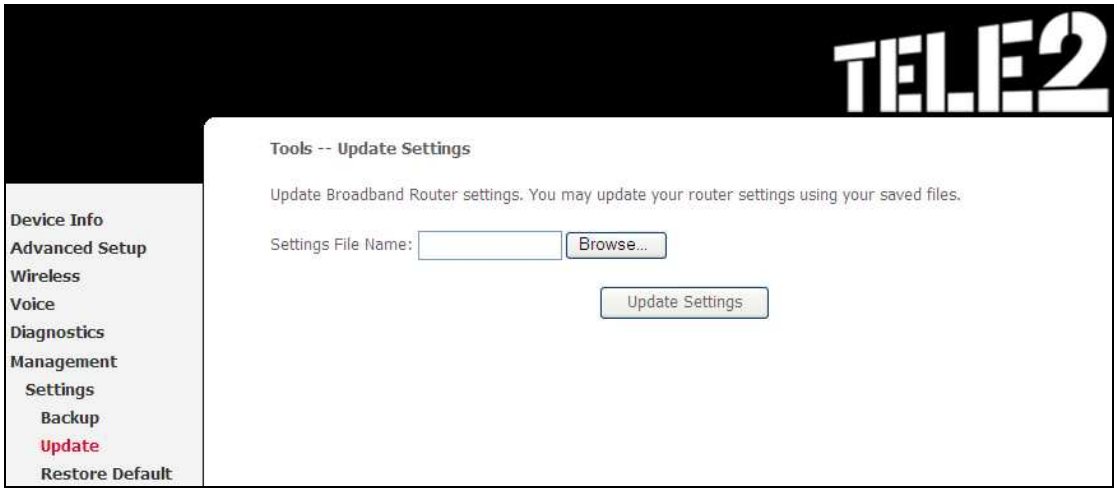
9.1.1 Backup Settings

To save the current configuration to a file on your PC, click **Backup Settings**. You will be prompted for backup file location. This file can later be used to recover settings on the **Update Settings** screen, as described below.



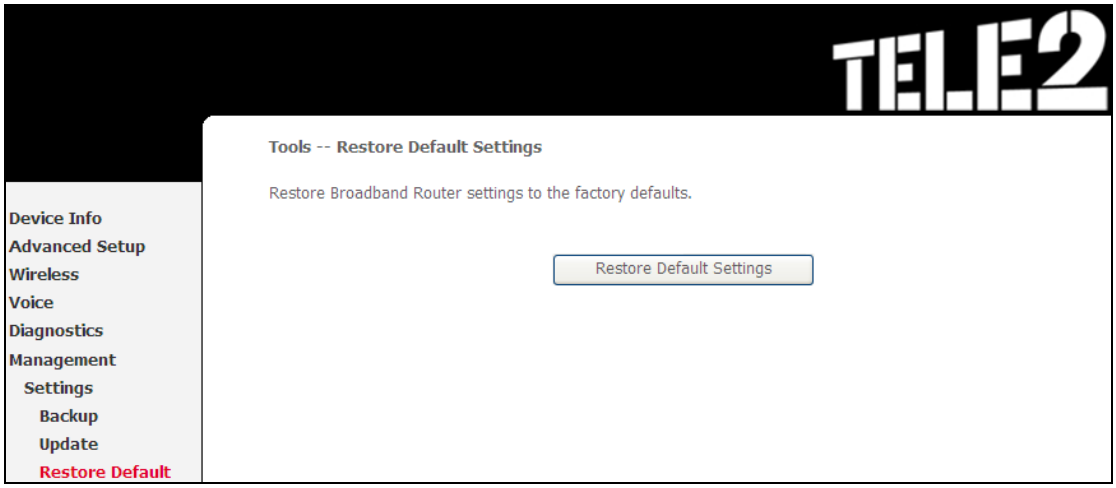
9.1.2 Update Settings

This option recovers configuration files previously saved using **Backup Settings**. Enter the file name (including folder path) in the **Settings File Name** box, or press **Browse...** to search for the file, then click **Update Settings** to recover settings.

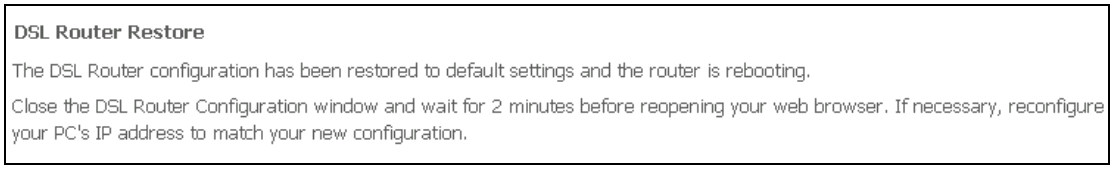


9.1.3 Restore Default

Click **Restore Default Settings** to restore factory default settings.



After **Restore Default Settings** is clicked, the following screen appears.


DSL Router Restore
The DSL Router configuration has been restored to default settings and the router is rebooting.
Close the DSL Router Configuration window and wait for 2 minutes before reopening your web browser. If necessary, reconfigure your PC's IP address to match your new configuration.

Close the browser and wait for 2 minutes before reopening it. It may also be necessary, to reconfigure your PC IP configuration to match any new settings.

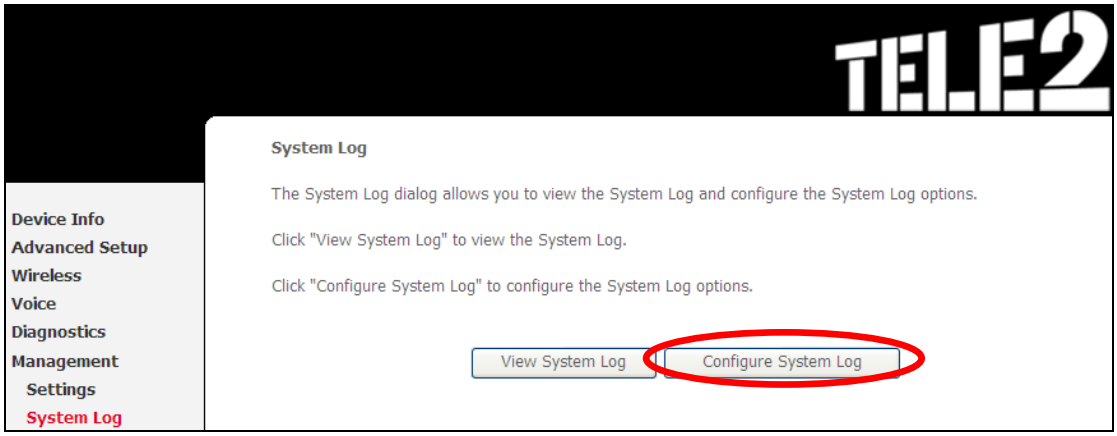
NOTE:	This entry has the same effect as the **Reset** button. The VI-3223u board hardware and the boot loader support the reset to default. If the **Reset** button is continuously pressed for more than 5 seconds, the boot loader will erase the configuration data saved in flash memory.

9.2 System Log

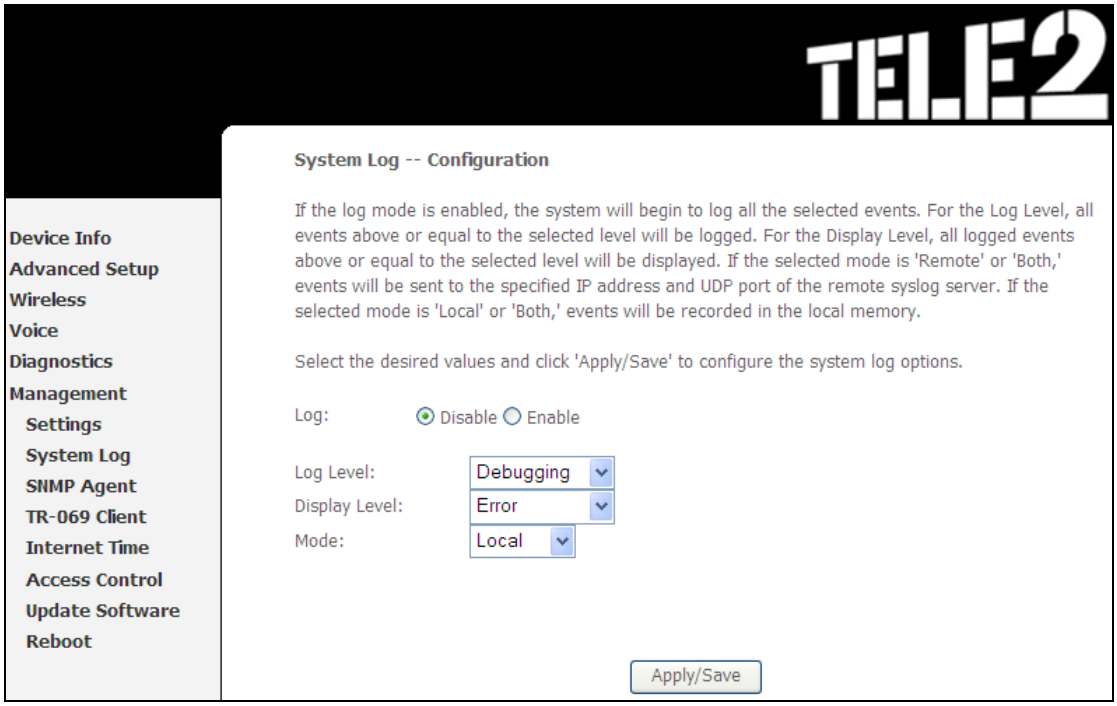
This function allows a system log to be kept and viewed upon request.

Follow the steps below to configure, enable, and view the system log.

STEP 1: Click **Configure System Log**, as shown below (circled in **Red**).



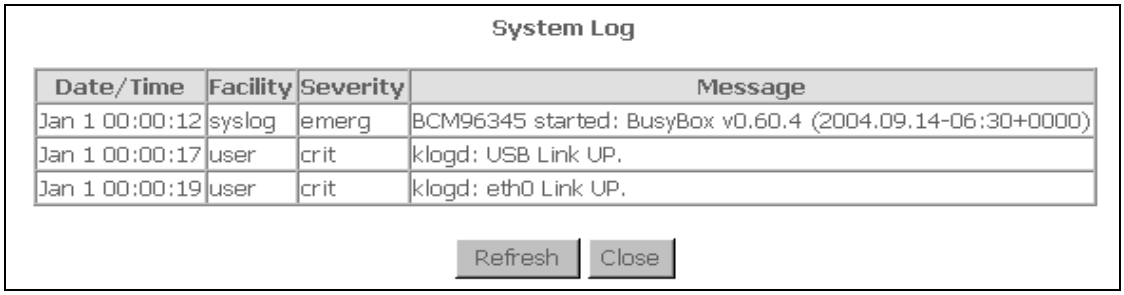
STEP 2: Select desired options and click **Apply/Save**.


Device Info
Advanced Setup
Wireless
Voice
Diagnostics
Management
Settings
System Log
SNMP Agent
TR-069 Client
Internet Time
Access Control
Update Software
Reboot
System Log -- Configuration
If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed. If the selected mode is 'Remote' or 'Both,' events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is 'Local' or 'Both,' events will be recorded in the local memory.
Select the desired values and click 'Apply/Save' to configure the system log options.
Log:
Disable
Enable
Log Level:
Debugging
Display Level:
Error
Mode:
Local
Apply/Save

Consult the table below for detailed descriptions of each system log option.

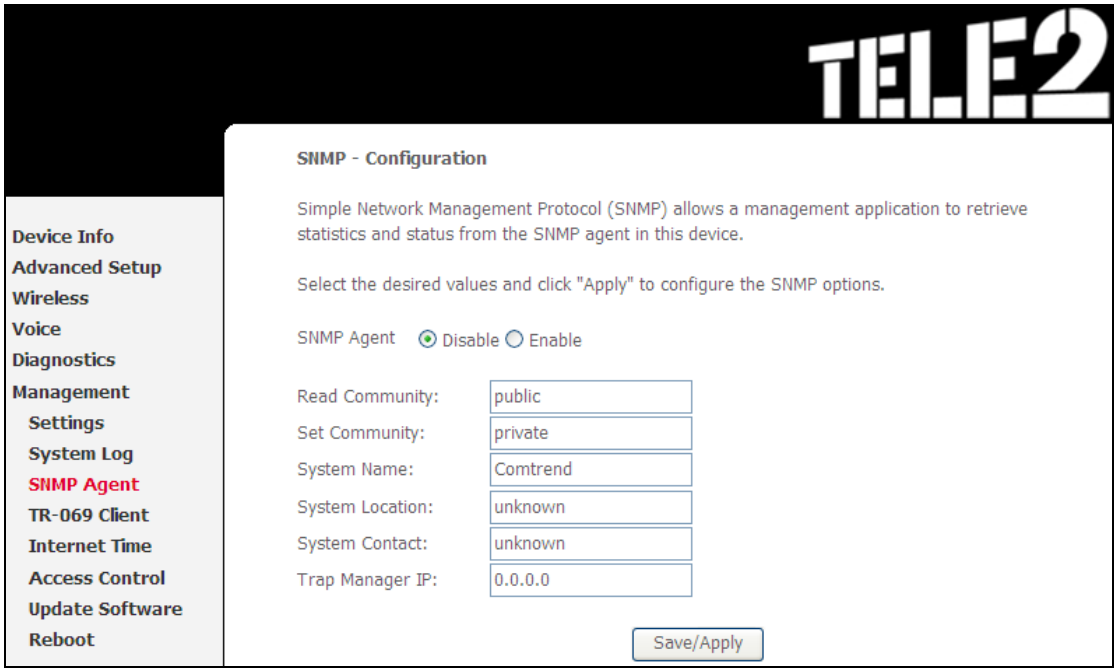
Option	Description
Log	Indicates whether the system is currently recording events. The user can enable or disable event logging. By default, it is disabled. To enable it, select the **Enable** radio button and then click **Apply/Save**.
Log Level	Allows you to configure the event level and filter out unwanted events below this level. The events ranging from the highest critical level "Emergency" down to this configured level will be recorded to the log buffer on the VI-3223u SDRAM. When the log buffer is full, the newer event will wrap up to the top of the log buffer and overwrite the old event. By default, the log level is "Debugging", which is the lowest critical level. The log levels are defined as follows: • Emergency = system is unusable • Alert = action must be taken immediately • Critical = critical conditions • Error = Error conditions • Warning = normal but significant condition • Notice= normal but insignificant condition • Informational= provides information for reference • Debugging = debug-level messages Emergency is the most serious event level, whereas Debugging is the least important. For instance, if the log level is set to Debugging, all the events from the lowest Debugging level to the most critical level Emergency level will be recorded. If the log level is set to Error, only Error and the level above will be logged.
Display Level	Allows the user to select the logged events and displays on the **View System Log** window for events of this level and above to the highest Emergency level.
Mode	Allows you to specify whether events should be stored in the local memory, or be sent to a remote system log server, or both simultaneously. If remote mode is selected, view system log will not be able to display events saved in the remote system log server. When either Remote mode or Both mode is configured, the WEB UI will prompt the user to enter the Server IP address and Server UDP port.

STEP 3: Click **View System Log**. The results are displayed as follows.



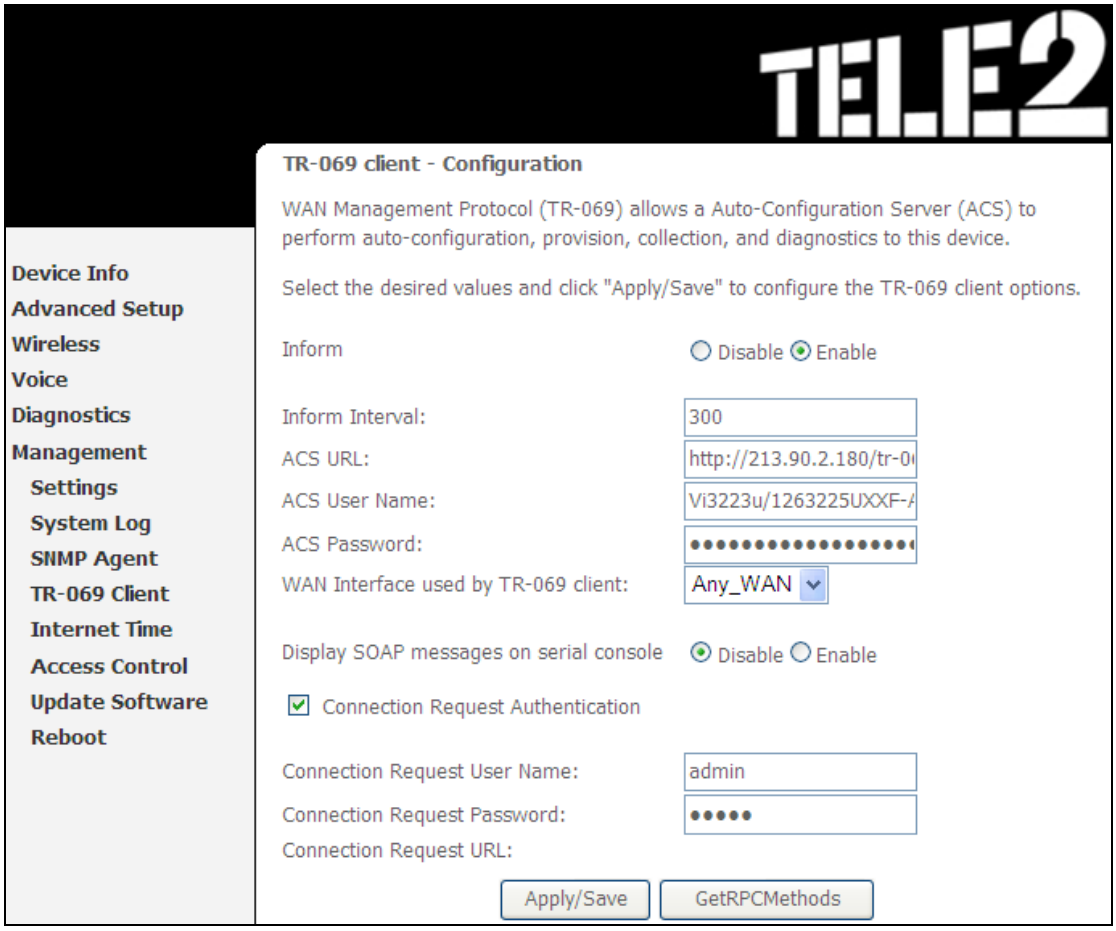
9.3 SNMP Agent

Simple Network Management Protocol (SNMP) allows a management application to retrieve statistics and status from the SNMP agent in this device. Select the **Enable** radio button, configure options, and click **Save/Apply** to activate SNMP.



9.4 TR-069 Client

WAN Management Protocol (TR-069) allows an Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device. Select desired values and click **Apply/Save** to configure TR-069 client options.



The table below is provided for ease of reference.

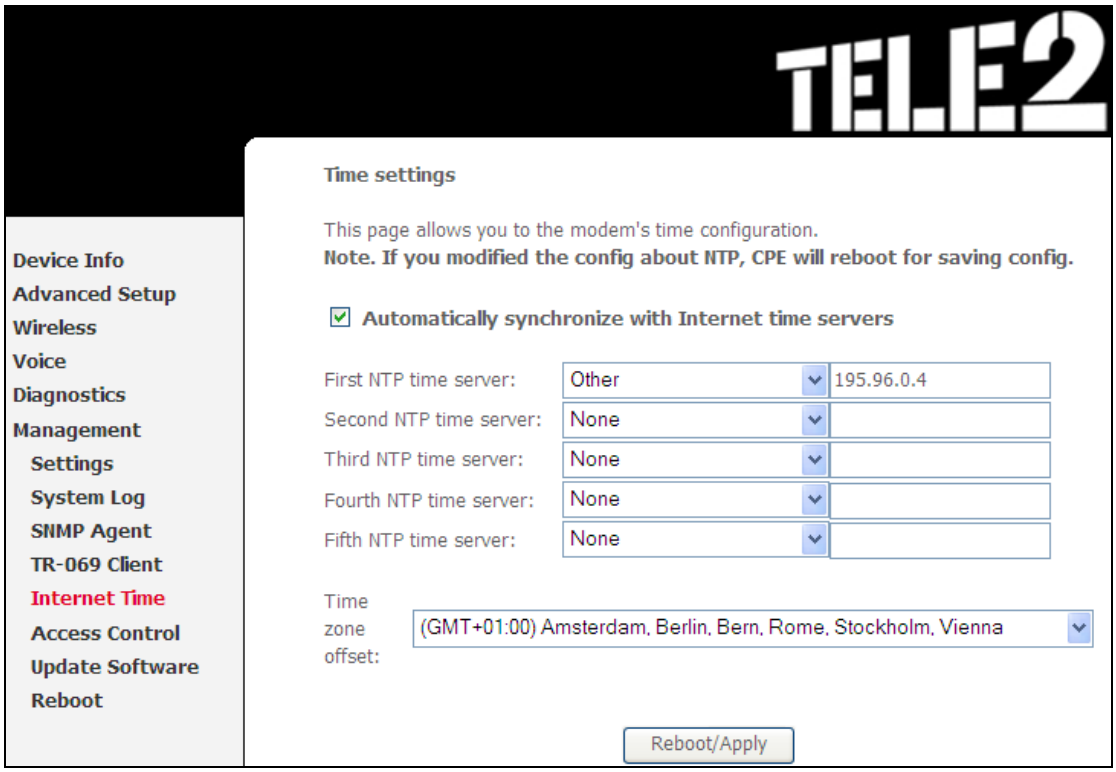
Option	Description
Inform	Disable/Enable TR-069 client on the CPE.
Inform Interval	The duration in seconds of the interval for which the CPE MUST attempt to connect with the ACS and call the Inform method.
ACS URL	URL for the CPE to connect to the ACS using the CPE WAN Management Protocol. This parameter MUST be in the form of a valid HTTP or HTTPS URL. An HTTPS URL indicates that the ACS supports SSL. The "host" portion of this URL is used by the CPE for validating the certificate from the ACS when using certificate-based authentication.

Option	Description
ACS User Name	Username used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This username is used only for HTTP-based authentication of the CPE.
ACS Password	Password used to authenticate the CPE when making a connection to the ACS using the CPE WAN Management Protocol. This password is used only for HTTP-based authentication of the CPE.
WAN Interface used by TR-069 client	Choose Any_WAN, LAN, Loopback or a configured connection.
Display SOAP messages on serial console	Enable/Disable SOAP messages on serial console. This option is used for advanced troubleshooting of the device.
Connection Request	
Authorization	Tick the checkbox ☑ to enable.
User Name	Username used to authenticate an ACS making a Connection Request to the CPE.
Password	Password used to authenticate an ACS making a Connection Request to the CPE.
URL	IP address and port the ACS uses to connect to VI-3223u.

The **Get RPC Methods** button forces the CPE to establish an immediate connection to the ACS. This may be used to discover the set of methods supported by the ACS or CPE. This list may include both standard TR-069 methods (those defined in this specification or a subsequent version) and vendor-specific methods. The receiver of the response MUST ignore any unrecognized methods.

9.5 Internet Time

This option automatically synchronizes the router time with Internet timeservers. To enable time synchronization, tick the corresponding checkbox ☑, choose your preferred time server(s), select the correct time zone offset, and click **Reboot/Apply**.



NOTE:	Internet Time must be activated to use Parental Control. In addition, this menu item is not displayed when in Bridge mode since the router would not be able to connect to the NTP timeserver.

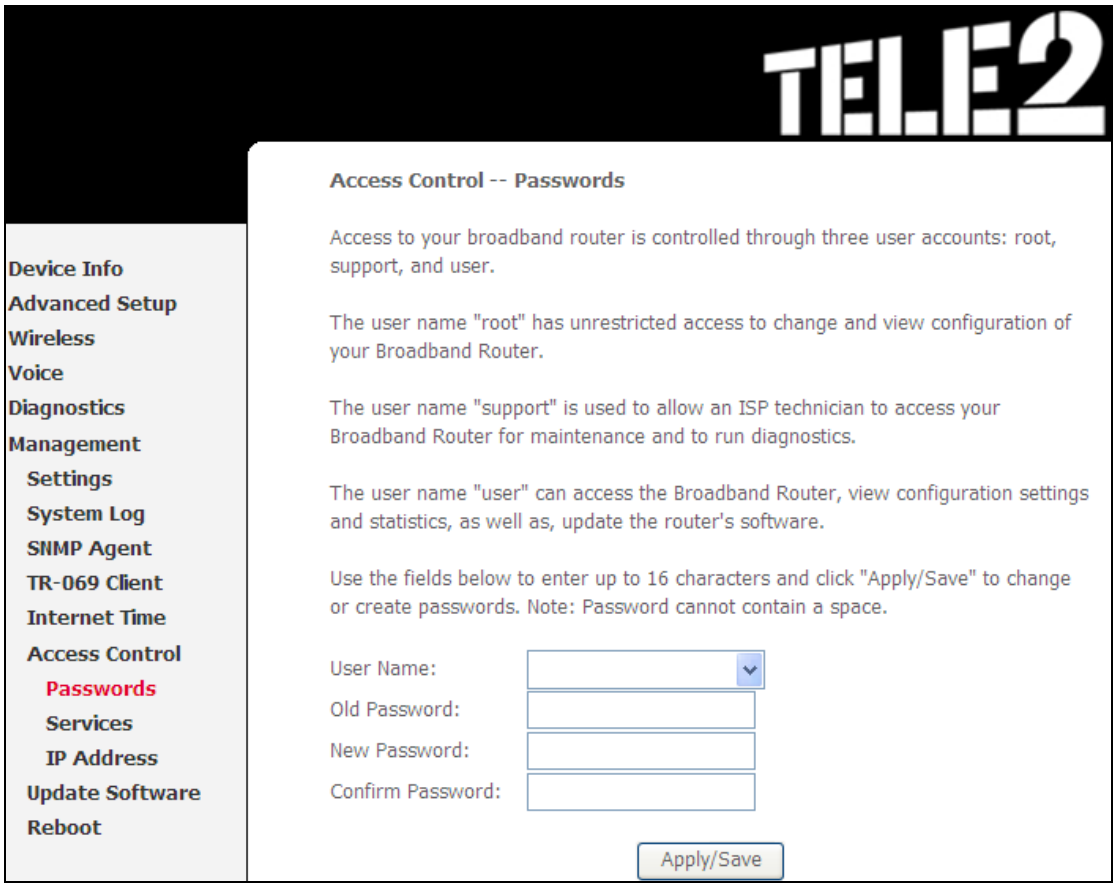
9.6 Access Control

9.6.1 Passwords

This screen is used to configure the user account access passwords for the device. Access to the VI-3223u is controlled through the following three user accounts:

- **root** - unrestricted access to change and view the configuration.
- **support** - used for remote maintenance and diagnostics of the router
- **user** - can view configuration settings & statistics and update firmware.

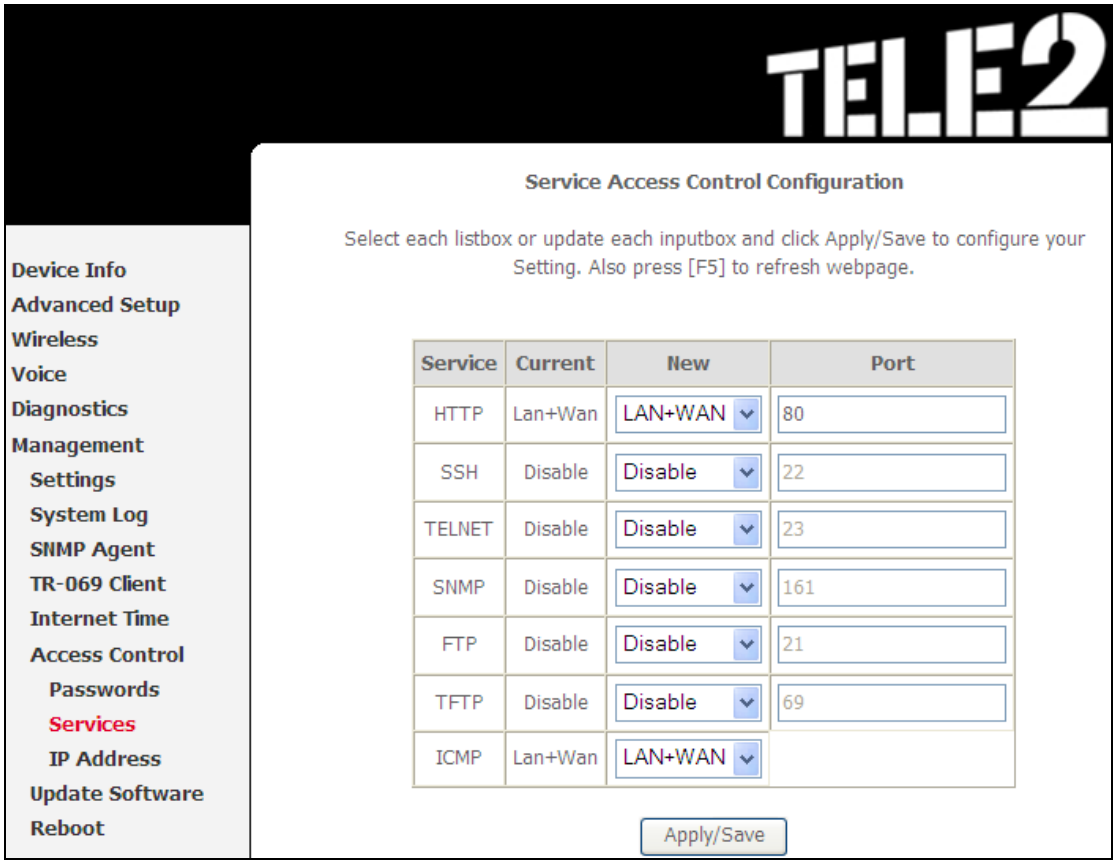
Use the fields below to change password settings. Click **Apply/Save** to continue.


TELE2
Device Info
Advanced Setup
Wireless
Voice
Diagnostics
Management
Settings
System Log
SNMP Agent
TR-069 Client
Internet Time
Access Control
Passwords
Services
IP Address
Update Software
Reboot
Access Control -- Passwords
Access to your broadband router is controlled through three user accounts: root, support, and user.
The user name "root" has unrestricted access to change and view configuration of your Broadband Router.
The user name "support" is used to allow an ISP technician to access your Broadband Router for maintenance and to run diagnostics.
The user name "user" can access the Broadband Router, view configuration settings and statistics, as well as, update the router's software.
Use the fields below to enter up to 16 characters and click "Apply/Save" to change or create passwords. Note: Password cannot contain a space.
User Name:
Old Password:
New Password:
Confirm Password:
Apply/Save

NOTE: Passwords can be up to 16 characters in length.

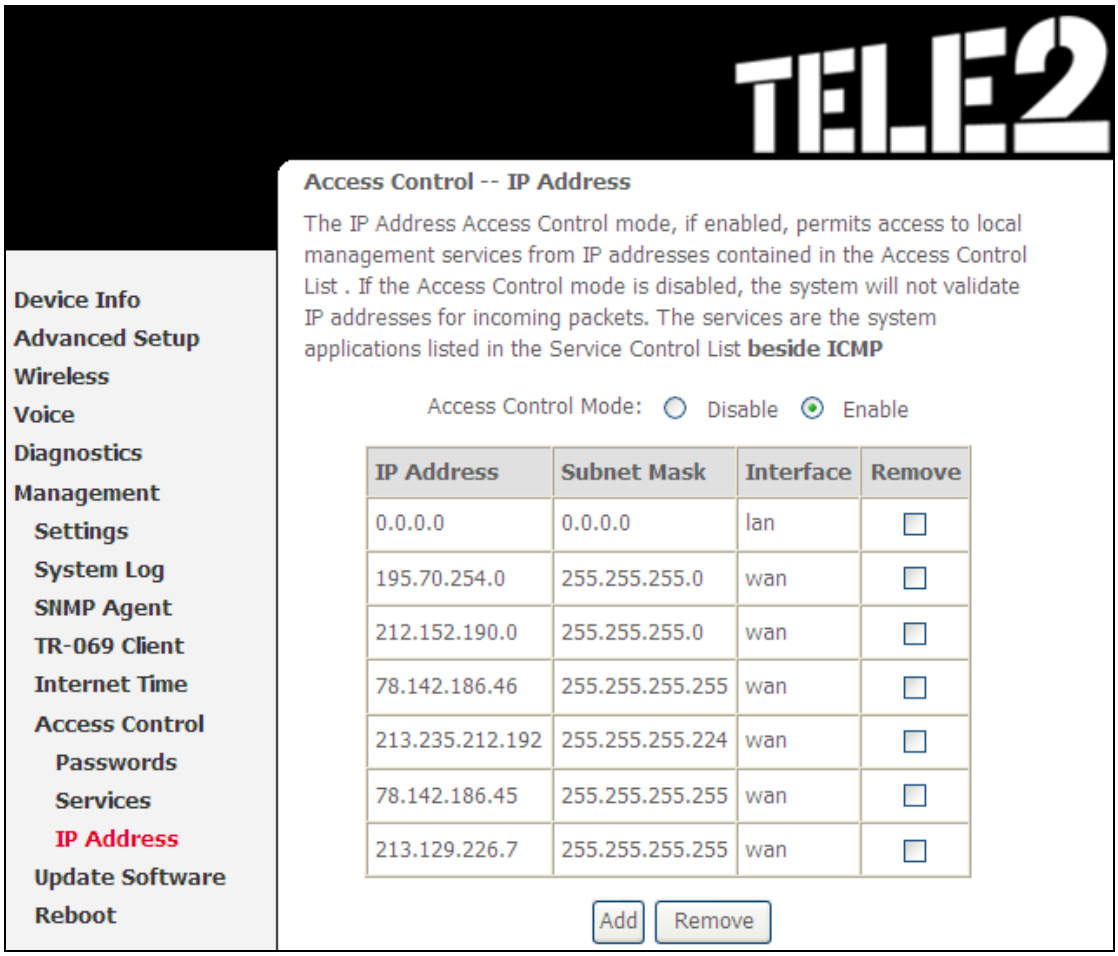
9.6.2 Services

The Services option limits or opens the access services over the LAN or WAN. These access services available are: FTP, HTTP, ICMP, SNMP, TELNET and TFTP. Enable a service by selecting its dropdown listbox. Click **APPLY/SAVE** to activate.

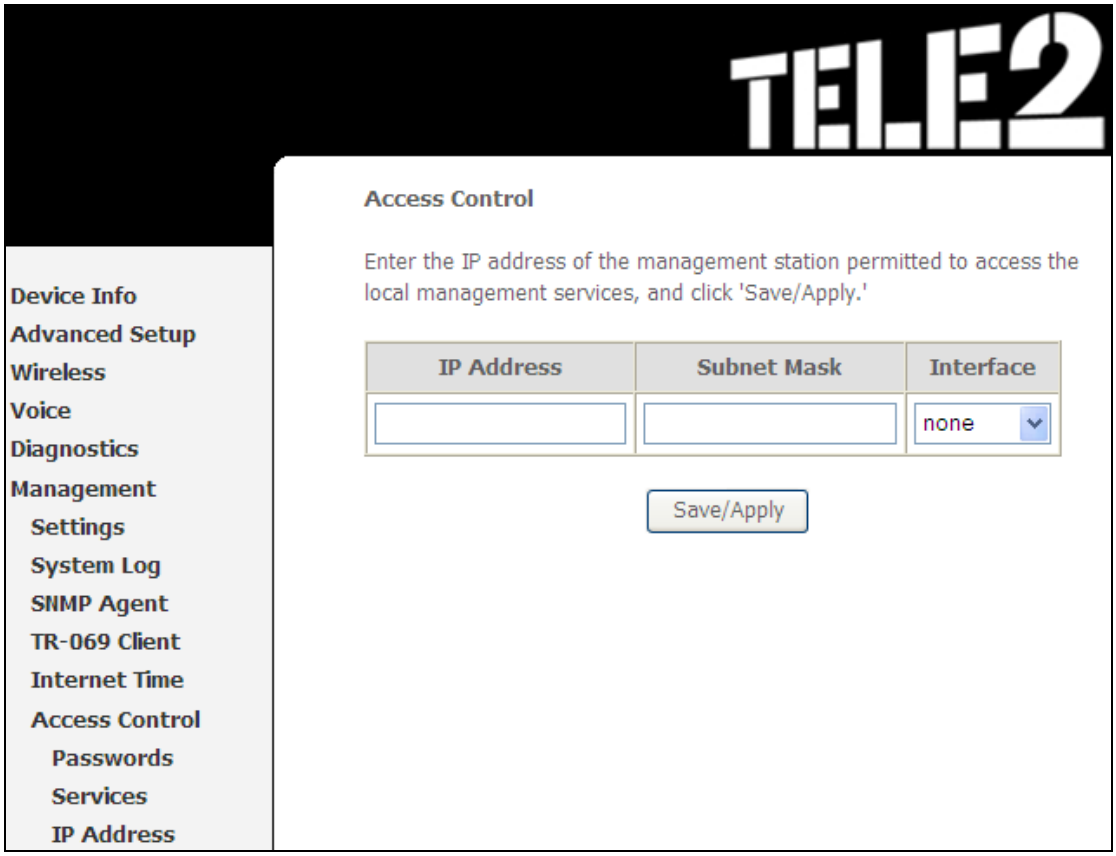


9.6.3 Services

The IP Address Access Control mode, if enabled, permits access to local management services from IP addresses contained in the Access Control List. If the Access Control mode is disabled, the system will not validate IP addresses for incoming packets. The services are the system applications listed in the Service Control List **beside ICMP.**



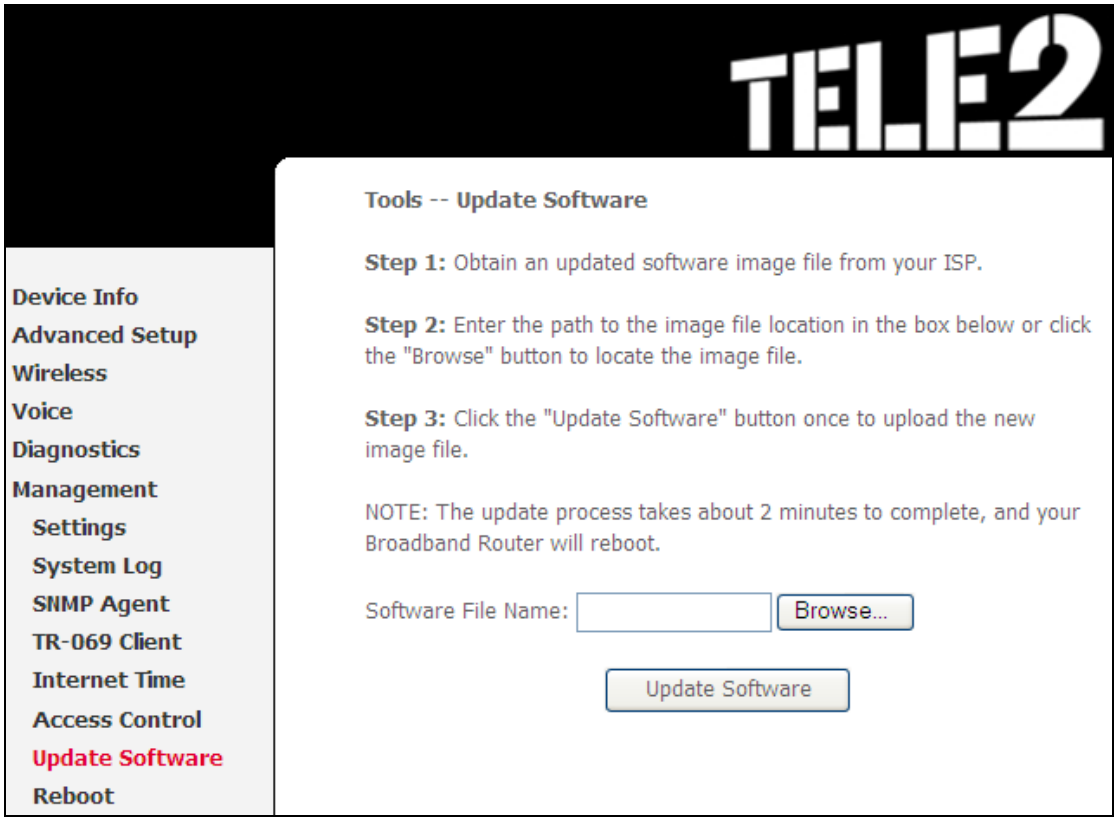
Click Add to display the following.



Enter the IP address of the management station permitted to access the local management services, and click the Save/Apply button.

9.7 Update Software

This option allows for firmware upgrades from a locally stored file.


Device Info
Advanced Setup
Wireless
Voice
Diagnostics
Management
Settings
System Log
SNMP Agent
TR-069 Client
Internet Time
Access Control
Update Software
Reboot
Tools -- Update Software
Step 1: Obtain an updated software image file from your ISP.
Step 2: Enter the path to the image file location in the box below or click the "Browse" button to locate the image file.
Step 3: Click the "Update Software" button once to upload the new image file.
NOTE: The update process takes about 2 minutes to complete, and your Broadband Router will reboot.
Software File Name:
Browse...
Update Software

STEP 1: Obtain an updated software image file from your ISP.

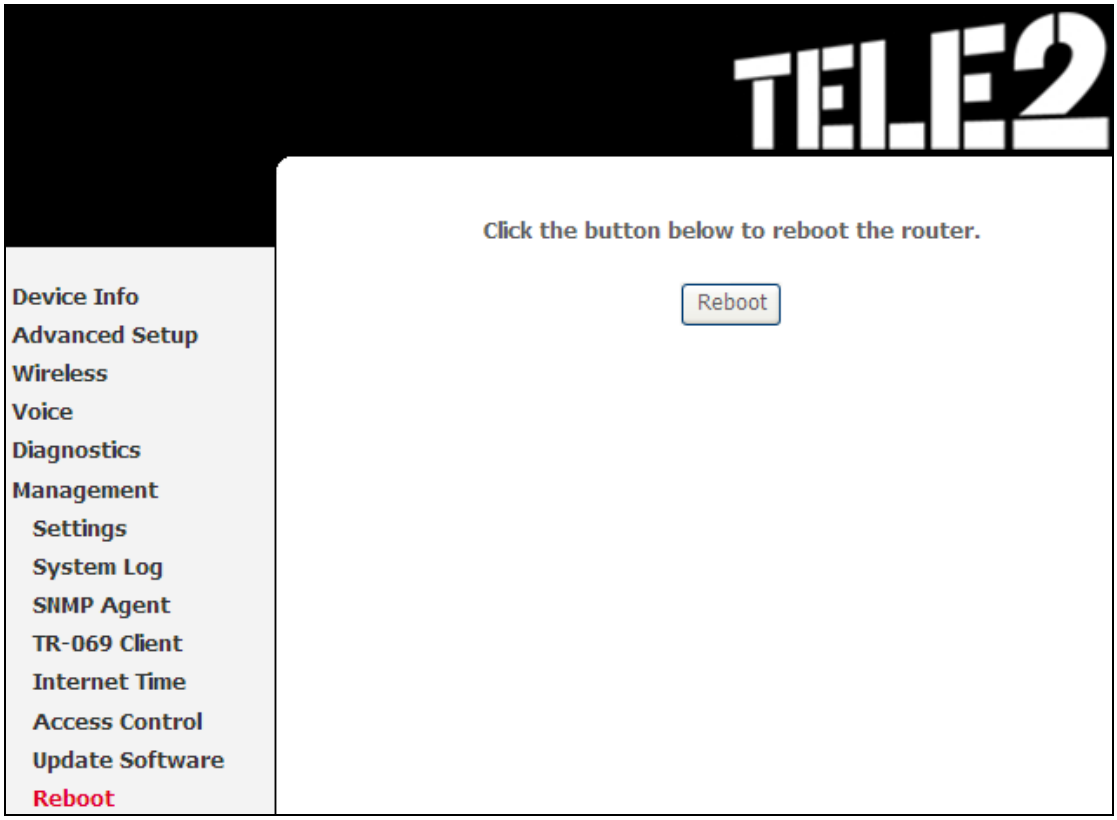
STEP 2: Enter the path and filename of the firmware image file in the **Software File Name** field or click the Browse button to locate the image file.

STEP 3: Click the **Update Software** button once to upload and install the file.

NOTE:	The update process will take about 2 minutes to complete. The device will reboot and the browser window will refresh to the default screen upon successful installation. It is recommended that you compare the **Software Version** on the Chapter 4 Device Information screen with the firmware version installed, to confirm the installation was successful.

9.8 Reboot

To save the current configuration and reboot the router, click **Reboot**.



NOTE: You may need to close the browser window and wait for 2 minutes before reopening it. It may also be necessary, to reset your PC IP configuration.

Appendix A - Firewall

STATEFUL PACKET INSPECTION
Refers to an architecture, where the firewall keeps track of packets on each connection traversing all its interfaces and makes sure they are valid. This is in contrast to static packet filtering which only examines a packet based on the information in the packet header.

DENIAL OF SERVICE ATTACK
Is an incident in which a user or organization is deprived of the services of a resource they would normally expect to have. Various DoS attacks the device can withstand are ARP Attack, Ping Attack, Ping of Death, Land, SYN Attack, Smurf Attack, and Tear Drop.

TCP/IP/PORT/INTERFACE FILTER
These rules help in the filtering of traffic at the Network layer (i.e. Layer 3). When a Routing interface is created, **Enable Firewall** must be checked. Navigate to Advanced Setup → Security → IP Filtering.

OUTGOING IP FILTER
Helps in setting rules to DROP packets from the LAN interface. By default, if the Firewall is Enabled, all IP traffic from the LAN is allowed. By setting up one or more filters, specific packet types coming from the LAN can be dropped.

Example 1:	Filter Name	: Out_Filter1
	Protocol	: TCP
	Source IP address	: 192.168.1.45
	Source Subnet Mask	: 255.255.255.0
	Source Port	: 80
	Dest. IP Address	: NA
	Dest. Subnet Mask	: NA
	Dest. Port	: NA

This filter will Drop all TCP packets coming from the LAN with IP Address/Subnet Mask of 192.168.1.45/24 having a source port of 80 irrespective of the destination. All other packets will be Accepted.

Example 2:	Filter Name	: Out_Filter2
	Protocol	: UDP
	Source IP Address	: 192.168.1.45
	Source Subnet Mask	: 255.255.255.0
	Source Port	: 5060:6060
	Dest. IP Address	: 172.16.13.4
	Dest. Subnet Mask	: 255.255.255.0
	Dest. Port	: 6060:7070

This filter will drop all UDP packets coming from the LAN with IP Address / Subnet Mask of 192.168.1.45/24 and a source port range of 5060 to 6060, destined to 172.16.13.4/24 and a destination port range of 6060 to 7070.

INCOMING IP FILTER
Helps in setting rules to Allow or Deny packets from the WAN interface. By default, all incoming IP traffic from the WAN is Blocked, if the Firewall is Enabled. By setting up one or more filters, specific packet types coming from the WAN can be Accepted.

Example 1:

Filter Name	: In_Filter1
Protocol	: TCP
Policy	: Allow
Source IP Address	: 210.168.219.45
Source Subnet Mask	: 255.255.0.0
Source Port	: 80
Dest. IP Address	: NA
Dest. Subnet Mask	: NA
Dest. Port	: NA
Selected WAN interface	: br0

This filter will ACCEPT all TCP packets coming from WAN interface "br0" with IP Address/Subnet Mask 210.168.219.45/16 with a source port of 80, irrespective of the destination. All other incoming packets on this interface are DROPPED.

Example 2:

Filter Name	: In_Filter2
Protocol	: UDP
Policy	: Allow
Source IP Address	: 210.168.219.45
Source Subnet Mask	: 255.255.0.0
Source Port	: 5060:6060
Dest. IP Address	: 192.168.1.45
Dest. Sub. Mask	: 255.255.255.0
Dest. Port	: 6060:7070
Selected WAN interface	: br0

This rule will ACCEPT all UDP packets coming from WAN interface "br0" with IP Address/Subnet Mask 210.168.219.45/16 and a source port in the range of 5060 to 6060, destined to 192.168.1.45/24 and a destination port in the range of 6060 to 7070. All other incoming packets on this interface are DROPPED.

MAC LAYER FILTER

These rules help in the filtering of Layer 2 traffic. MAC Filtering is only effective in Bridge mode. After a Bridge mode connection is created, navigate to Advanced Setup → Security → MAC Filtering in the WUI.

Example 1:

Global Policy	: Forwarded
Protocol Type	: PPPoE
Dest. MAC Address	: 00:12:34:56:78:90
Source MAC Address	: NA
Src. Interface	: eth1
Dest. Interface	: eth2

Addition of this rule drops all PPPoE frames going from eth1 to eth2 with a Destination MAC Address of 00:12:34:56:78:90 irrespective of its Source MAC Address. All other frames on this interface are forwarded.

Example 2:

Global Policy	: Blocked
Protocol Type	: PPPoE
Dest. MAC Address	: 00:12:34:56:78:90
Source MAC Address	: 00:34:12:78:90:56
Src. Interface	: eth1
Dest. Interface	: eth2

Addition of this rule forwards all PPPoE frames going from eth1 to eth2 with a Destination MAC Address of 00:12:34:56:78 and Source MAC Address of 00:34:12:78:90:56. All other frames on this interface are dropped.

DAYTIME PARENTAL CONTROL

This feature restricts access of a selected LAN device to an outside Network through the VI-3223u, as per chosen days of the week and the chosen times.

Example:

User Name	: FilterJohn
Browser's MAC Address	: 00:25:46:78:63:21
Days of the Week	: Mon, Wed, Fri
Start Blocking Time	: 14:00
End Blocking Time	: 18:00

With this rule, a LAN device with MAC Address of 00:25:46:78:63:21 will have no access to the WAN on Mondays, Wednesdays, and Fridays, from 2pm to 6pm. On all other days and times, this device will have access to the outside Network.

Appendix B - Pin Assignments

ETHERNET Ports (RJ45)

Pin	Definition	Pin	Definition
1	Transmit data+	5	NC
2	Transmit data-	6	Receive data-
3	Receive data+	7	NC
4	NC	8	NC

Appendix C – SSH Client

Unlike Microsoft Windows, Linux OS has a ssh client included. For Windows users, there is a public domain one called "putty" that can be downloaded from here:

http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

To access the ssh client you must first enable SSH access for the LAN or WAN from the Management → Access Control → Services menu in the web user interface.

To access the router using the Linux ssh client

For LAN access, type: ssh -l root 192.168.1.1

For WAN access, type: ssh -l support *WAN IP address*

To access the router using the Windows "putty" ssh client

For LAN access, type: putty -ssh -l root 192.168.1.1

For WAN access, type: putty -ssh -l support *WAN IP address*

NOTE: The *WAN IP address* can be found on the Device Info → WAN screen

Appendix D - Specifications

Hardware Interface

RJ-11 X1 for ADSL2+/VDSL2, RJ-45 X 4 for LAN, RJ-45 X 1 for GigaWAN, FXS X2, Reset Button X 1, WPS button x1, Wi-Fi On/Off button x 1, Wi-Fi Antennas X 2, Power switch X 1, USB Host X2

WAN

ADSL standard
ITU-T G.992.5, ITU-T G.992.3, ITU-T G.992.1, ANSI T1.413 Issue 2, AnnexM

ADSL2+
Downstream : 24 Mbps Upstream : 1.3 Mbps

VDSL2 standard
ITU-Y G.993.2 (supporting profile 8a, 8b, 8c, 8d, 12a, 12b, 17a)

VDSL2
Downstream : 100 Mbps Upstream : 60 Mbps

LAN Interface

Standard.....IEEE 802.3, IEEE 802.3u
10/100 BaseT .....Auto-sense
MDI/MDX support.....Yes

WLAN Interface

Standard .....IEEE802.11n (IEEE802.11b/g compatible)
Encryption.....64/128-bit Wired Equivalent Privacy (WEP)
Channels.....11 (US, Canada)/ 13 (Europe)/ 14 (Japan)
Data Rate.....Up to 300Mbps
WPA .....Yes
IEEE 802.1x .....Yes
WMM .....Yes
WEP .....Yes
WPS .....Yes
MAC Filtering .....Yes

ATM Attributes

RFC 2364 (PPPoA), RFC 2684 (RFC 1483) Bridge/Route; RFC 2516 (PPPoE); RFC 1577 (IPoA)
Support 16 PVCs
AAL5
UBR/CBR/VBR
UNI 3.1/4.0
OAM F4/F5

Management

Compliant with TR-069/TR-098/TR-104/TR-111 remote management protocols, Telnet, Web-based management, Configuration backup and restoration, Software upgrade via HTTP / TFTP / FTP server

Routing Functions

Static route, RIP v1/v2, NAT/PAT, DMZ, DHCP Server/Relay/Client, DNS Proxy, ARP, IGMP Proxy

Bridge Functions

IEEE 802.1d, VLAN support, Spanning Tree Algorithm, IGMP Proxy

Security Functions

Authentication protocol： PAP, CHAP
Port Triggering/Forwarding, Packet and MAC address filtering, SSH, Access Control, VPN

QoS

L3 policy-based QoS, IP QoS, ToS

Voice

SIP .....RFC 3261
MGCP .....RFC 3435
Codec G.711, G.723.1, G.726, G.729ab
RTP .....RFC 1889
SDP .....RFC 2327
Caller ID .....ETSI based

Power Supply .....12 Vdc / 2 A

Environment Condition

Operating temperature .....0 ~ 40 degrees Celsius
Relative humidity .....5 ~ 95% (non-condensing)

Dimensions .....256.2 x 166 x 47.9

Kit Weight

(1*VI-3223u, 1* RJ-11 cable, 1* RJ-45 cable, 1* USB cable, 1* Power Adapter, 1* CD-ROM) = 1.1 kg

Certifications.....CE

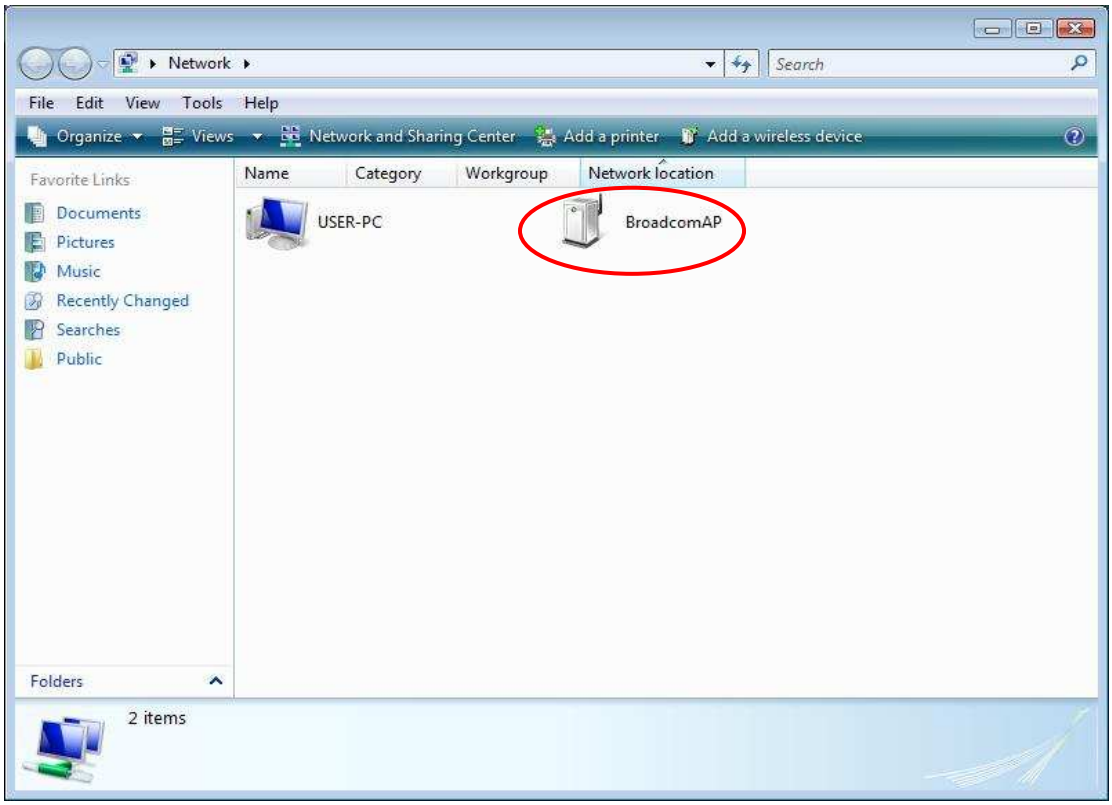
NOTE: Specifications are subject to change without notice

Appendix E - WPS External Registrar

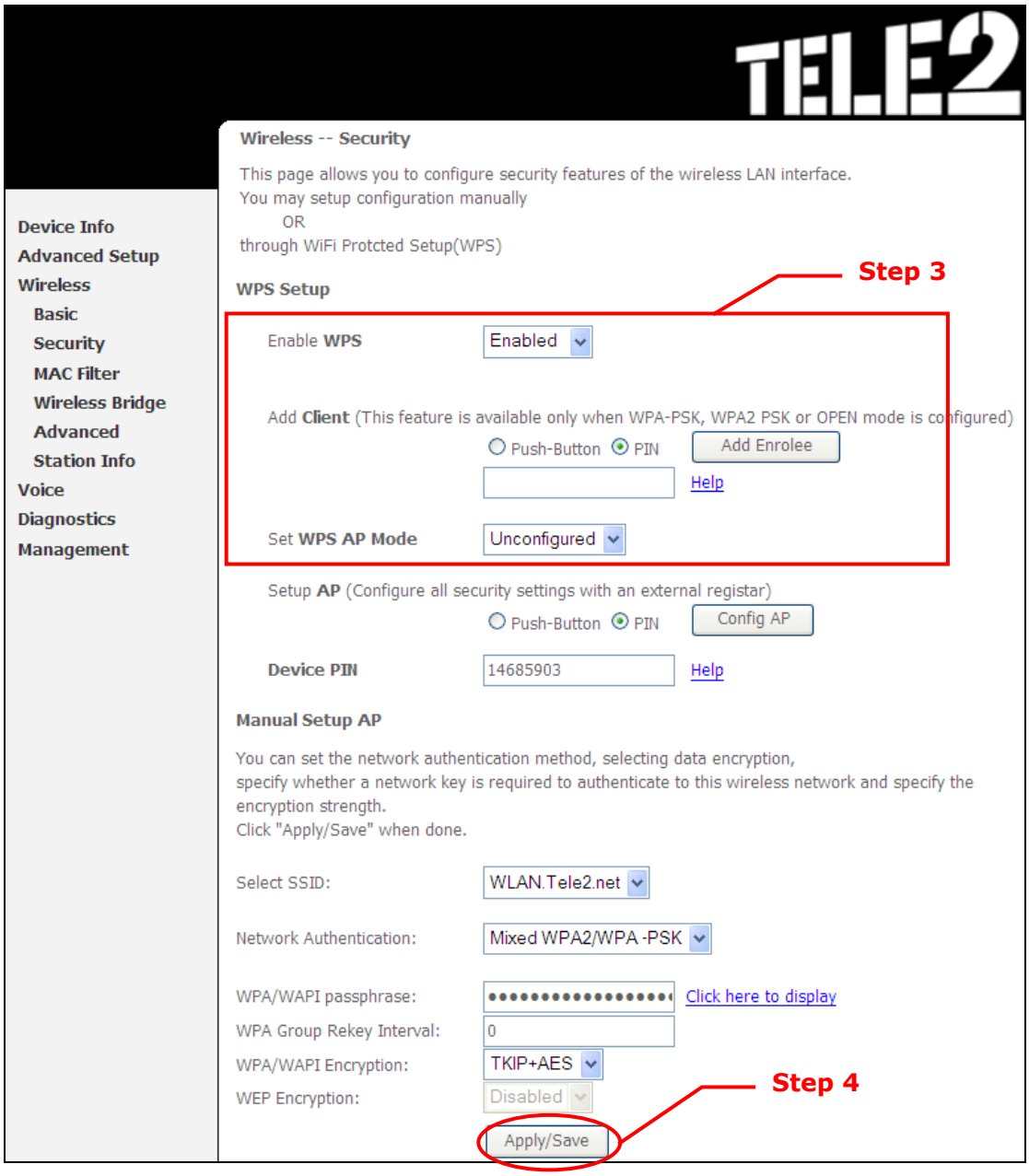
Follow these steps to add an external registrar using the web user interface (WUI) on a personal computer running the Windows Vista operating system:

Step 1: Enable UPnP on the Advanced Setup.

Step 2: Open the Network folder and look for the BroadcomAP icon.

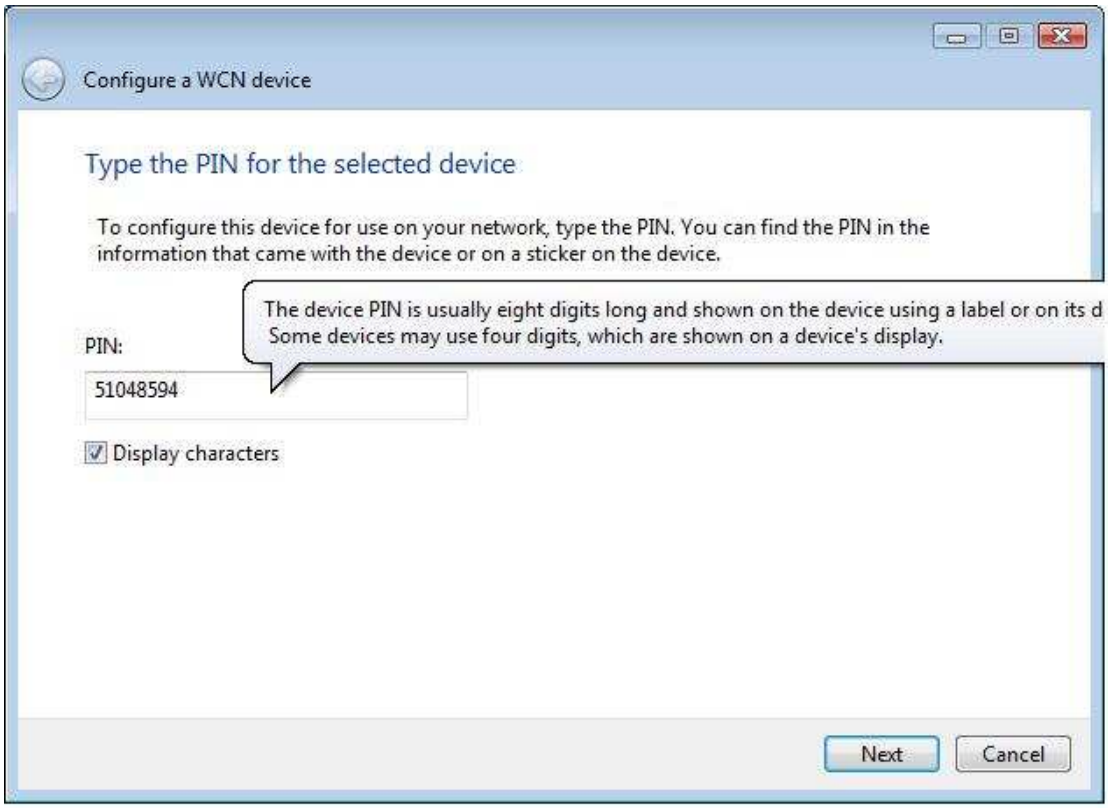


Step 3: On the Wireless → Security screen, enable WPS by selecting **Enabled** from the drop down list box and set the WPS AP Mode to Unconfigured. Click the **Apply/Save** button at the bottom of the screen



Step 4:
Click the **Apply/Save** button at the bottom of the screen. The screen will refresh while the route applies the new wireless settings.

Step 5: Now return to the Network folder and click the BroadcomAP icon. A dialog box will appear asking for the Device PIN number. Enter the Device PIN as shown on the Wireless → Security screen. Click **Next**.


Configure a WCN device
Type the PIN for the selected device
To configure this device for use on your network, type the PIN. You can find the PIN in the information that came with the device or on a sticker on the device.
The device PIN is usually eight digits long and shown on the device using a label or on its d
Some devices may use four digits, which are shown on a device's display.
PIN:
51048594
Display characters
Next
Cancel

Step 6: Windows Vista will attempt to configure the wireless security settings.

Step 7: If successful, the security settings will match those in Windows Vista.

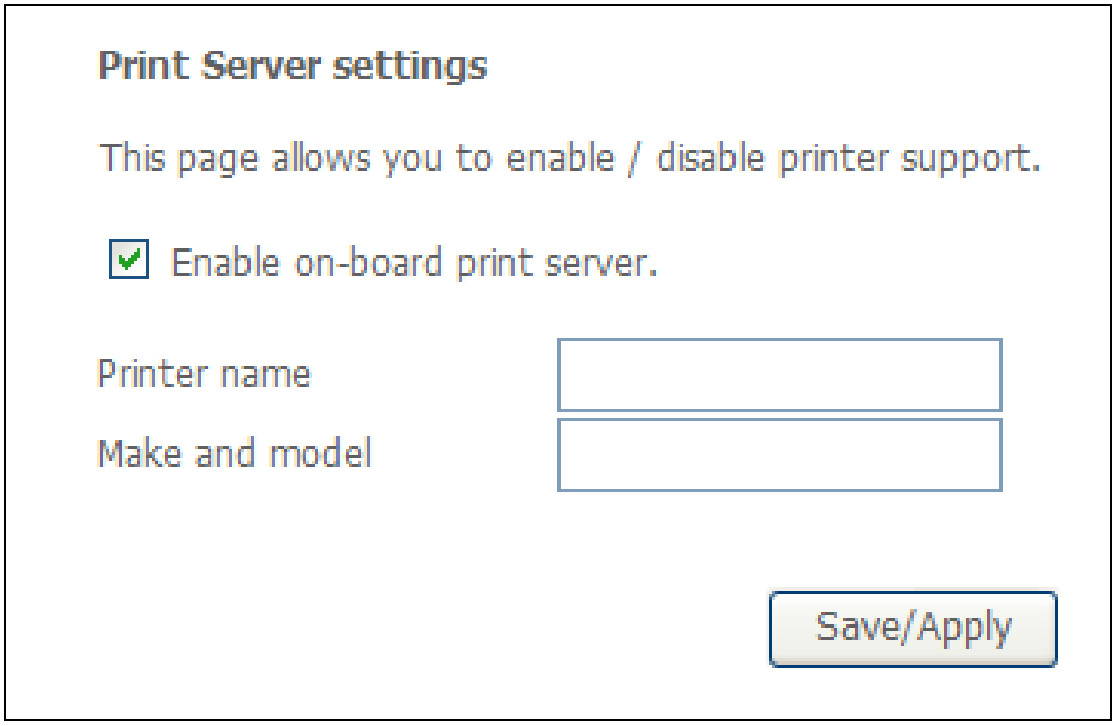
Appendix F - Printer Server

These steps explain the procedure for enabling the Printer Server.

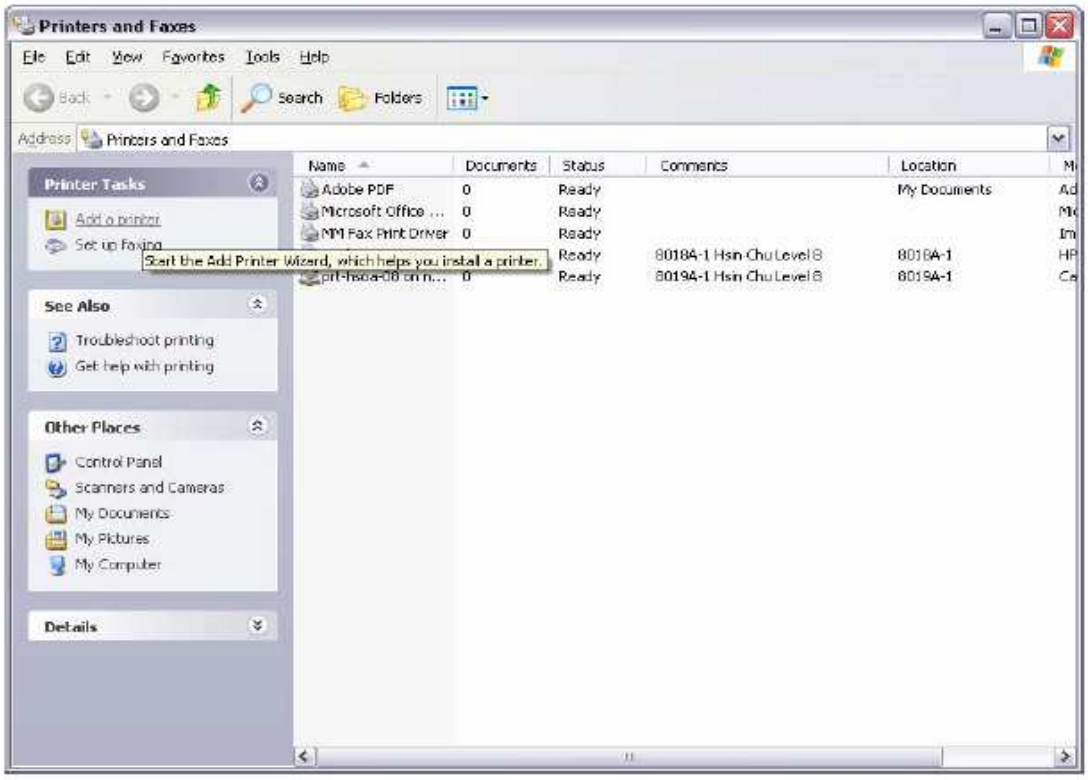
NOTE:	This function only applies to models with an USB host port.

STEP 1: Enable Print Server from Web User Interface. Select Enable on-board print server checkbox ☑ and enter Printer name and Make and model

NOTE:	The **Printer name** can be any text string up to 40 characters. The **Make and model** can be any text string up to 128 characters.



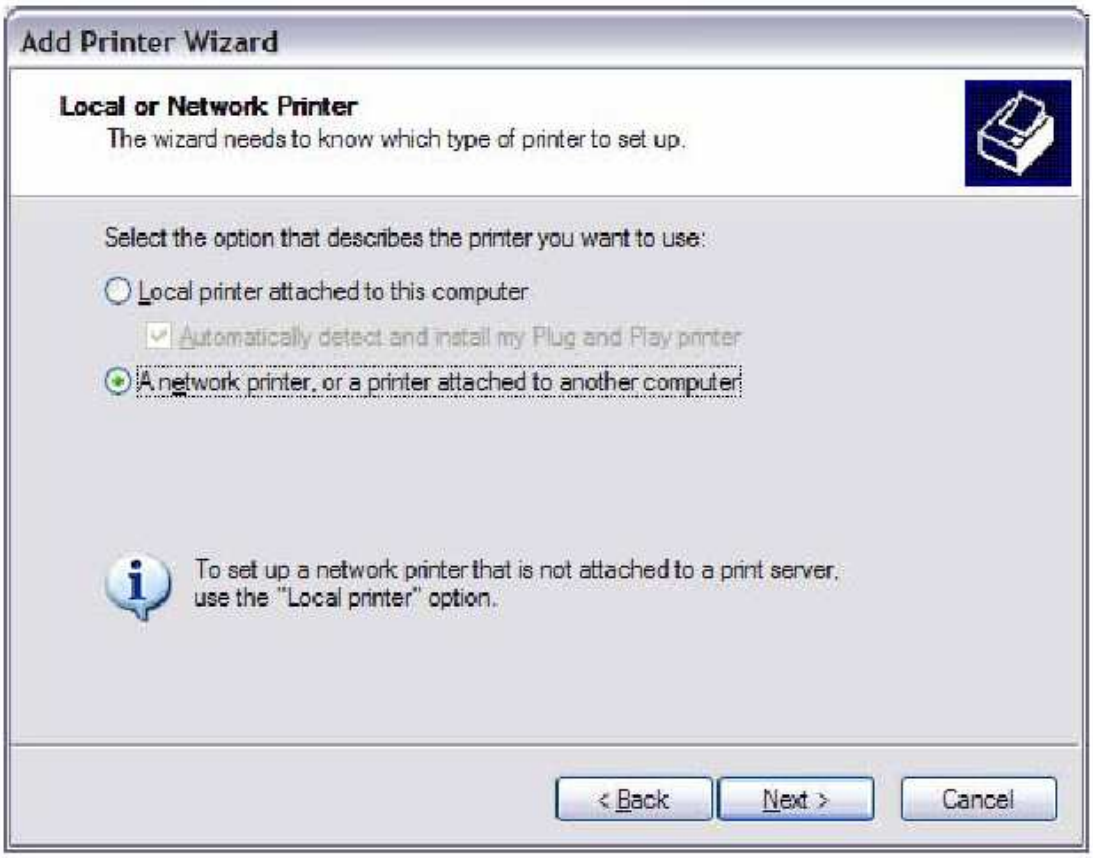
STEP 2: Go to the **Printers and Faxes** application in the **Control Panel** and select the **Add a printer** function (as located on the side menu below).



STEP 3: Click **Next** to continue when you see the dialog box below.

Add Printer Wizard
Welcome to the Add Printer Wizard
This wizard helps you install a printer or make printer connections.
If you have a Plug and Play printer that connects through a USB port (or any other hot pluggable port, such as IEEE 1394, infrared, and so on), you do not need to use this wizard. Click Cancel to close the wizard, and then plug the printer's cable into your computer or point the printer toward your computer's infrared port, and turn the printer on. Windows will automatically install the printer for you.
To continue, click Next.
< Back
Next >
Cancel

STEP 4: Select **Network Printer** and click **Next**.

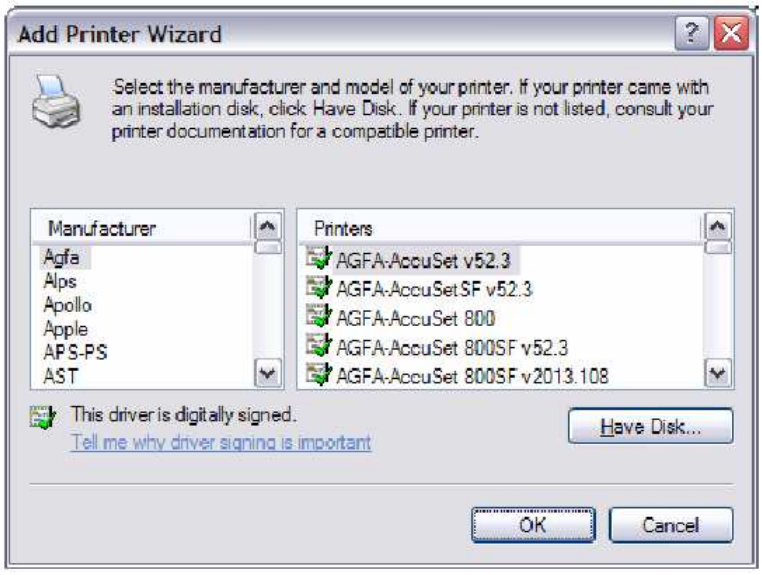

Add Printer Wizard
Local or Network Printer
The wizard needs to know which type of printer to set up.
Select the option that describes the printer you want to use:
Local printer attached to this computer
Automatically detect and install my Plug and Play printer
A network printer, or a printer attached to another computer
To set up a network printer that is not attached to a print server, use the "Local printer" option.
< Back
Next >
Cancel

STEP 5: Select Connect to a printer on the Internet and enter your printer link. (e.g. http://192.168.1.1:631/printers/hp3845) and click **Next**.

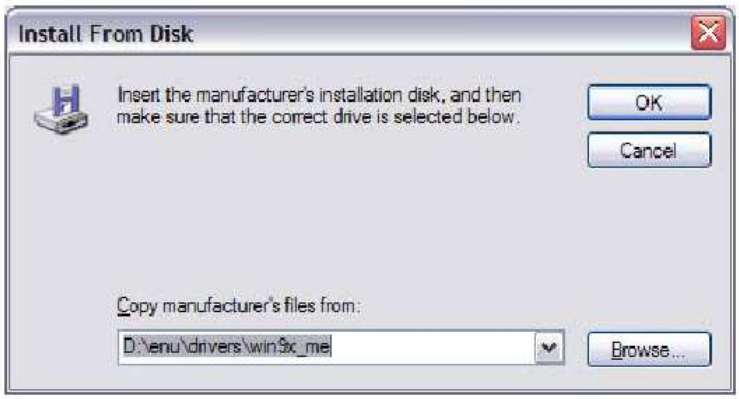
NOTE:	The printer name must be the same name entered in the ADSL modem WEB UI "printer server setting" as in step 1.

Add Printer Wizard
Specify a Printer
If you don't know the name or address of the printer, you can search for a printer that meets your needs.
What printer do you want to connect to?
Find a printer in the directory
Connect to this printer (or to browse for a printer, select this option and click Next):
Name:
Example: \\server\printer
Connect to a printer on the Internet or on a home or office network:
URL:
http://192.168.1.1:631/printers/hp3845
Example: http://server/printers/myprinter/.printer
< Back
Next >
Cancel

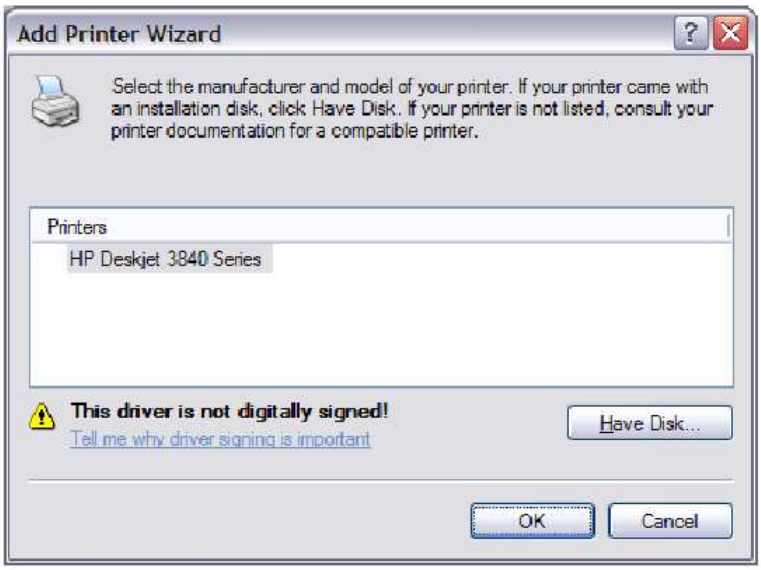
STEP 6: Click **Have Disk** and insert the printer driver CD.



STEP 7: Select driver file directory on CD-ROM and click **OK**.



STEP 8: Once the printer name appears, click **OK**.

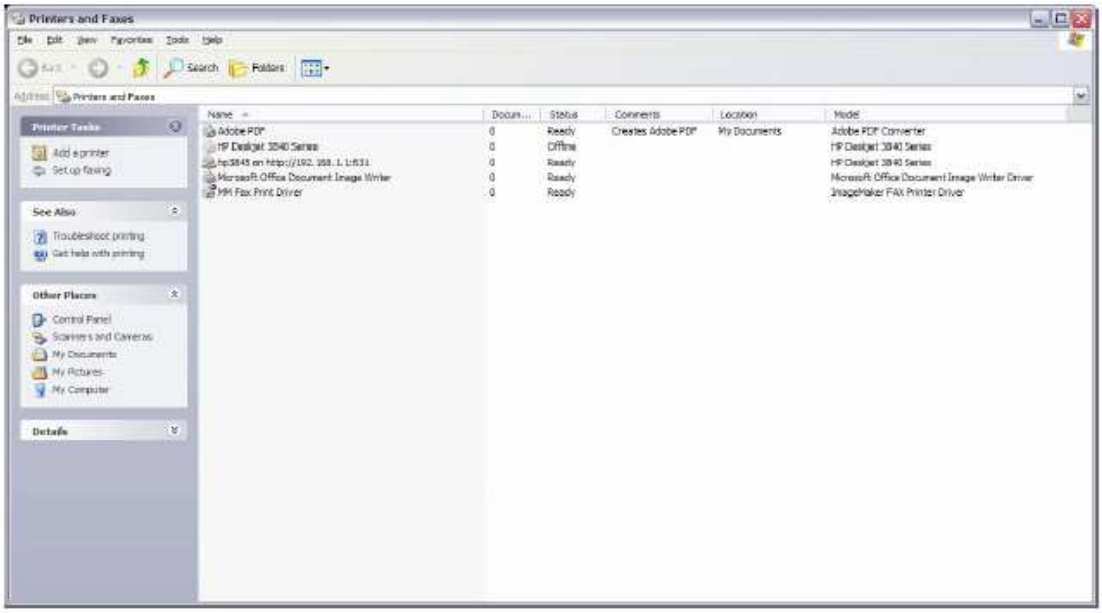

Add Printer Wizard
Select the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.
Printers
HP Deskjet 3840 Series
This driver is not digitally signed!
Tell me why driver signing is important
Have Disk...
OK
Cancel

STEP 9: Choose **Yes** or **No** for default printer setting and click **Next.**

Add Printer Wizard
Default Printer
Your computer will always send documents to the default printer unless you specify otherwise.
Do you want to use this printer as the default printer?
Yes
No
< Back
Next >
Cancel

STEP 10: Click Finish.

STEP 11: Check the status of printer from Windows Control Panel, printer window. Status should show as **Ready**.



Appendix G - Connection Setup

Creating a WAN connection is a two-stage process.

1 - Setup a Layer 2 Interface (ATM, PTM or Ethernet).
2 - Add a WAN connection to the Layer 2 Interface.

The following sections describe each stage in turn.

G1 ~ Layer 2 Interfaces

Every layer2 interface operates in one of three modes: Default, VLAN Mux or MSC. A short introduction to each of these three modes is included below for reference. It is important to understand the differences between these connection modes, as they determine the number and types of connections that may be configured.

DEFAULT MODE

In this mode there is a 1:1 relationship between interfaces and WAN connections, in that an interface in default mode supports just one connection. However, unlike the multiple connection modes described below, it supports all five connection types. The figure below shows the some connection types available in ATM default mode.

Interface	Description	Type	Vlan8021p	VlanMuxId	Igmp	NAT	Firewall	IPv6	Mld	Connect/Disconnect	Remove	Edit
atm1	ipoe_0_0_40	IPoE	N/A	N/A	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	☐	Edit
atm2	br_0_6_66	Bridge	N/A	N/A	Disabled	N/A	Disabled	Disabled	Disabled	Disabled	☐	Edit
ppp0	pppoe_0_0_35	PPPoE	N/A	N/A	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	☐	Edit

VLAN MUX MODE

This mode uses VLAN tags to allow for multiple connections over a single interface. PPPoE, IPoE, and Bridge are supported while PPPoA and IPoA connections are not. The figure below shows multiple connections over a single VLAN Mux interface.

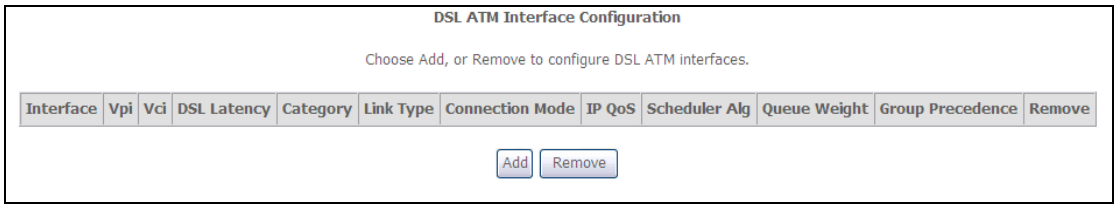
Interface	Description	Type	Vlan8021p	VlanMuxId	Igmp	NAT	Firewall	Connect/Disconnect	Remove	Edit
atm0.2	ipoe_0_0_35.77	IPoE	3	77	Disabled	Disabled	Disabled	Disabled	☐	Edit
atm0.3	br_0_0_35.444	Bridge	4	444	Disabled	N/A	Disabled	Disabled	☐	Edit
ppp0.1	pppoe_0_0_35.555	PPPoE	6	555	Disabled	Disabled	Disabled	Disabled	☐	Edit

G1.1 ATM Interfaces

Follow these procedures to configure an ATM interface.

NOTE:	The VI-3223u supports up to 16 ATM interfaces.

STEP 1: Go to Advanced Setup → Layer2 Interface → ATM Interface.

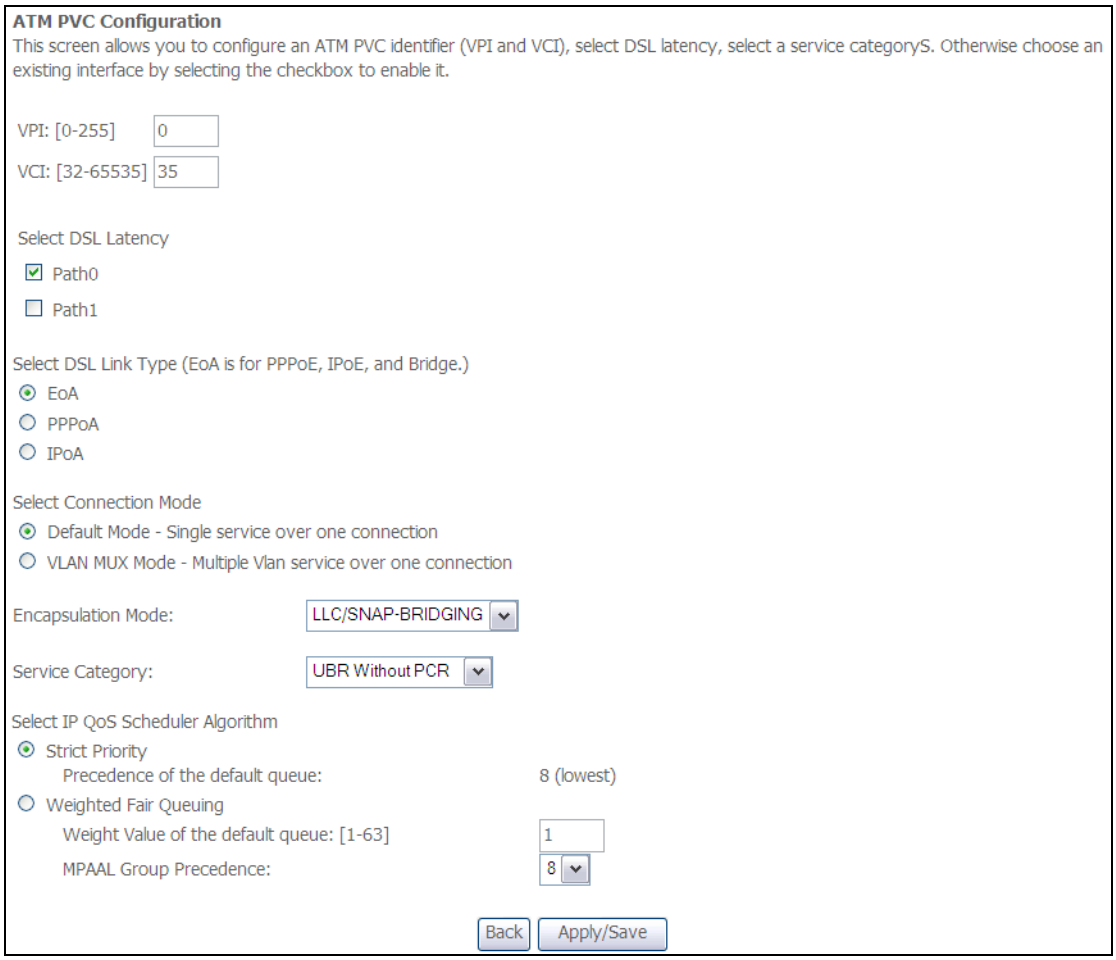


This table is provided here for ease of reference.

Heading	**Description**
Interface	WAN interface name.
VPI	ATM VPI (0-255)
VCI	ATM VCI (32-65535)
DSL Latency	{Path0} → portID = 0 {Path1} → port ID = 1 {Path0&1} → port ID = 4
Category	ATM service category
Link Type	Choose EoA (for PPPoE, IPoE, and Bridge), PPPoA, or IPoA.
Connection Mode	Default Mode – Single service over one connection Vlan Mux Mode – Multiple Vlan service over one connection MSC Mode – Multiple Service over one Connection
QoS	Quality of Service (QoS) status
Scheduler Alg	The algorithm used to schedule the dequeue behavior.
Queue Weight	The weight of the specified queue.
Group Precedence	The Precedence of the specified group.
Remove	Select items for removal

STEP 2: Click **Add** to proceed to the next screen.

NOTE:	To add WAN connections to one interface type, you must delete existing connections from the other interface type using the **remove** button.


ATM PVC Configuration
This screen allows you to configure an ATM PVC identifier (VPI and VCI), select DSL latency, select a service categoryS. Otherwise choose an existing interface by selecting the checkbox to enable it.
VPI: [0-255] 0
VCI: [32-65535] 35
Select DSL Latency
Path0
Path1
Select DSL Link Type (EoA is for PPPoE, IPoE, and Bridge.)
EoA
PPPoA
IPoA
Select Connection Mode
Default Mode - Single service over one connection
VLAN MUX Mode - Multiple Vlan service over one connection
Encapsulation Mode: LLC/SNAP-BRIDGING
Service Category: UBR Without PCR
Select IP QoS Scheduler Algorithm
Strict Priority
Precedence of the default queue: 8 (lowest)
Weighted Fair Queuing
Weight Value of the default queue: [1-63] 1
MPAAL Group Precedence: 8
Back
Apply/Save

There are many settings here including: VPI/VCI, DSL Latency, DSL Link Type, Encapsulation Mode, Service Category, Connection Mode and Quality of Service.

The table below shows xDSL Link Type availability with each Connection Mode.

	xDSL Link Type		
Connection Mode	EoA*	PPPoA	IPoA
Default Mode	OK	OK	OK
VLAN Mux Mode	OK	X	X

* EoA includes PPPoE, IPoE, and Bridge link types.

Here are the available encapsulations for each xDSL Link Type:

- EoA- LLC/SNAP-BRIDGING, VC/MUX
- PPPoA- VC/MUX, LLC/ENCAPSULATION
- IPoA- LLC/SNAP-ROUTING, VC MUX

STEP 3: Click **Apply/Save** to confirm your choices.

On the next screen, check that the ATM interface is added to the list. For example, an ATM interface on PVC 0/35 in Default Mode with an EoA Link type is shown below.

Interface	Vpi	Vci	DSL Latency	Category	Link Type	Connection Mode	IP QoS	Scheduler Alg	Queue Weight	Group Precedence	Remove
atm0	0	35	Path0	UBR	EoA	DefaultMode	Enabled	SP			☐

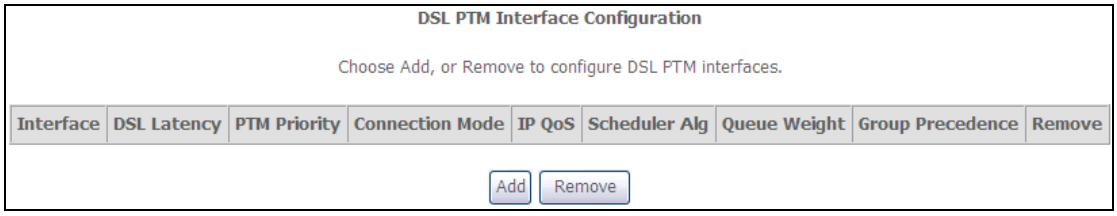
To add a WAN connection go to G2 ~ WAN Connections

G1.2 PTM Interfaces

Follow these procedures to configure a PTM interface.

NOTE: The VI-3223u supports up to four PTM interfaces.

STEP 4: Go to Advanced Setup → Layer2 Interface → PTM Interface.

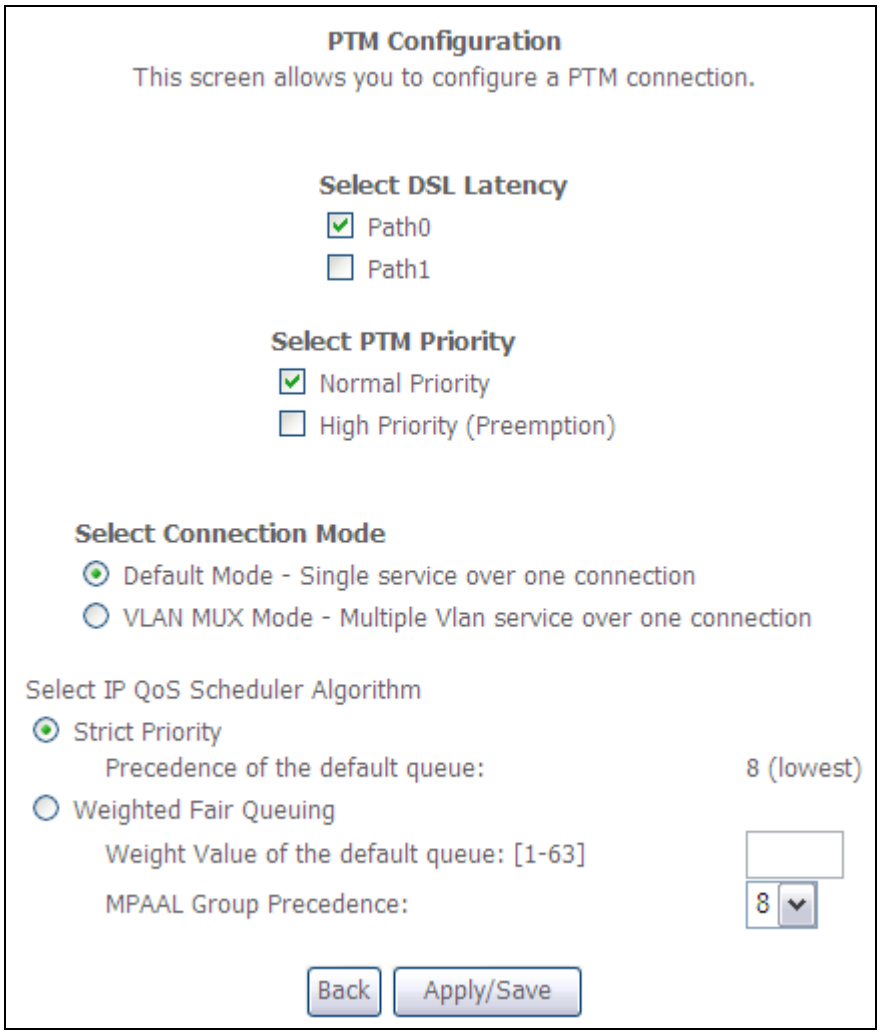


This table is provided here for ease of reference.

Heading	Description
Interface	WAN interface name.
DSL Latency	{Path0} → portID = 0 {Path1} → port ID = 1 {Path0&1} → port ID = 4
PTM Priority	Normal or High Priority (Preemption).
Connection Mode	Default Mode – Single service over one interface. Vlan Mux Mode – Multiple Vlan services over one interface.
QoS	Quality of Service (QoS) status.
Scheduler Alg	The algorithm used to schedule the dequeue behavior.
Queue Weight	The weight of the specified queue.
Group Precedence	The Precedence of the specified group.
Remove	Select interfaces to remove.

STEP 5: Click **Add** to proceed to the next screen.

NOTE: To add WAN connections to one interface type, you must delete existing connections from the other interface type using the **remove** button.

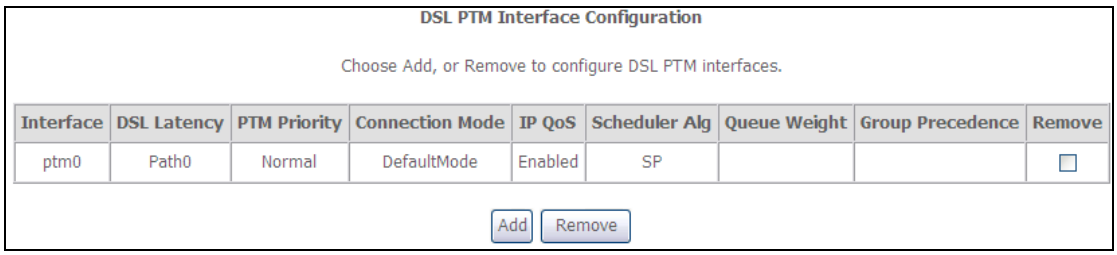


There are many settings that can be configured here including:
DSL Latency, PTM Priority, Connection Mode and Quality of Service.

STEP 6: Click **Apply/Save** to confirm your choices.

On the next screen, check that the PTM interface is added to the list.

For example, an PTM interface in Default Mode is shown below.



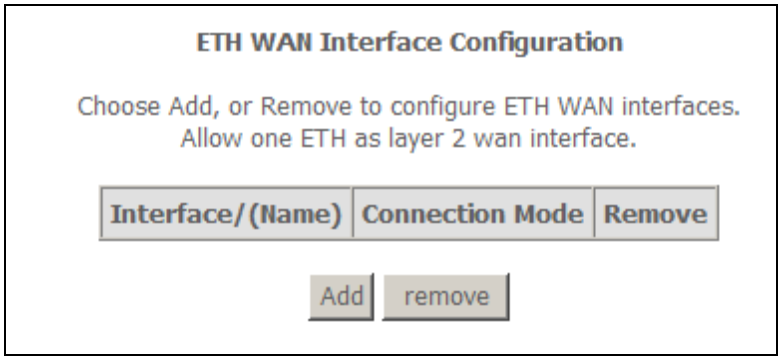
To add a WAN connection go to G2 ~ WAN Connections.

G1.3 Ethernet WAN Interface

Some models of the VI-3223u support a single Ethernet WAN interface over the ETH WAN port. Follow these procedures to configure an Ethernet WAN interface.

NOTE:	To add WAN connections to one interface type, you must delete existing connections from the other interface type using the **remove** button.

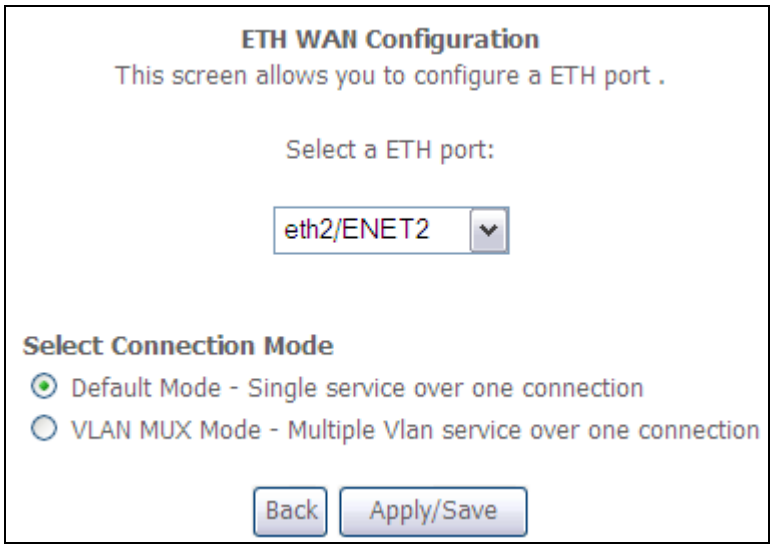
STEP 1: Go to Advanced Setup → Layer2 Interface → ETH Interface.



This table is provided here for ease of reference.

Heading	Description
Interface/ (Name)	ETH WAN Interface
Connection Mode	Default Mode – Single service over one connection Vlan Mux Mode – Multiple Vlan service over one connection
Remove	Select the checkbox and click **Remove** to remove the connection.

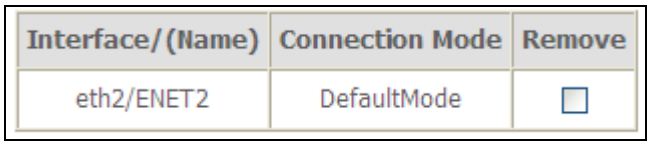
STEP 2: Click **Add** to proceed to the next screen.


ETH WAN Configuration
This screen allows you to configure a ETH port .
Select a ETH port:
eth2/ENET2
Select Connection Mode
Default Mode - Single service over one connection
VLAN MUX Mode - Multiple Vlan service over one connection
Back
Apply/Save

STEP 3: Select a Connection Mode from the options shown above.

STEP 4: Click **Apply/Save** to confirm your choice.

The figure below shows an Ethernet WAN interface configured in Default Mode.



Interface/(Name)	Connection Mode	Remove
eth2/ENET2	DefaultMode	☐

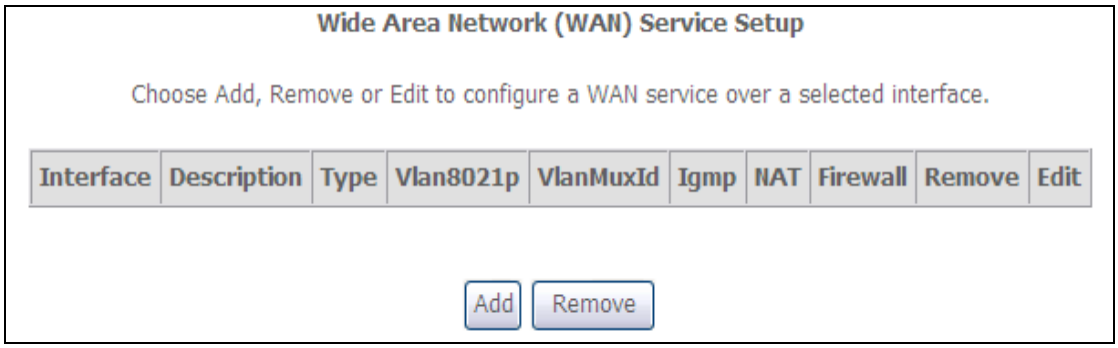
To add a WAN connection go to G2 ~ WAN Connections.

G2 ~ WAN Connections

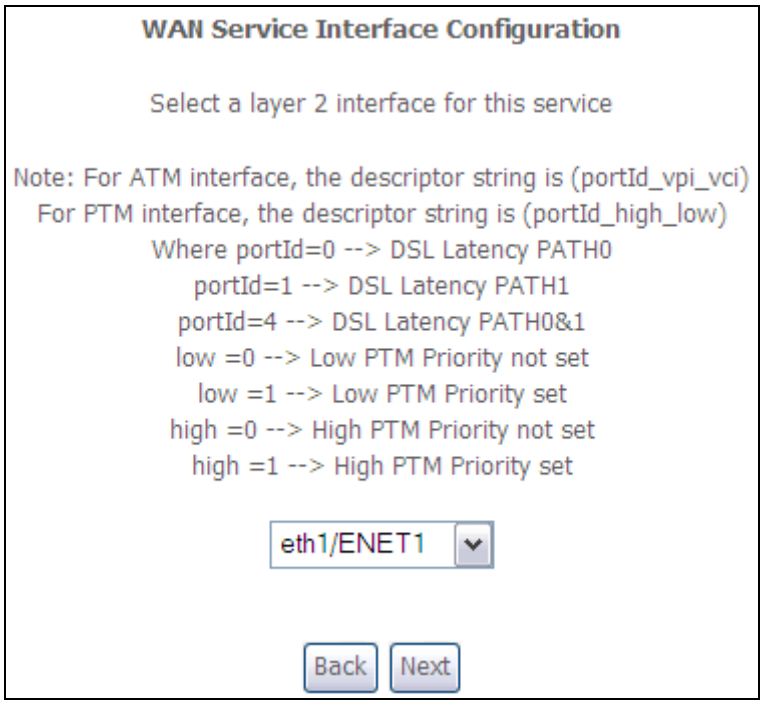
In Default Mode, the VI-3223u supports one WAN connection for each interface, up to a maximum of 8 connections. VLAN Mux can support up to 16 connections.

To setup a WAN connection follow these instructions.

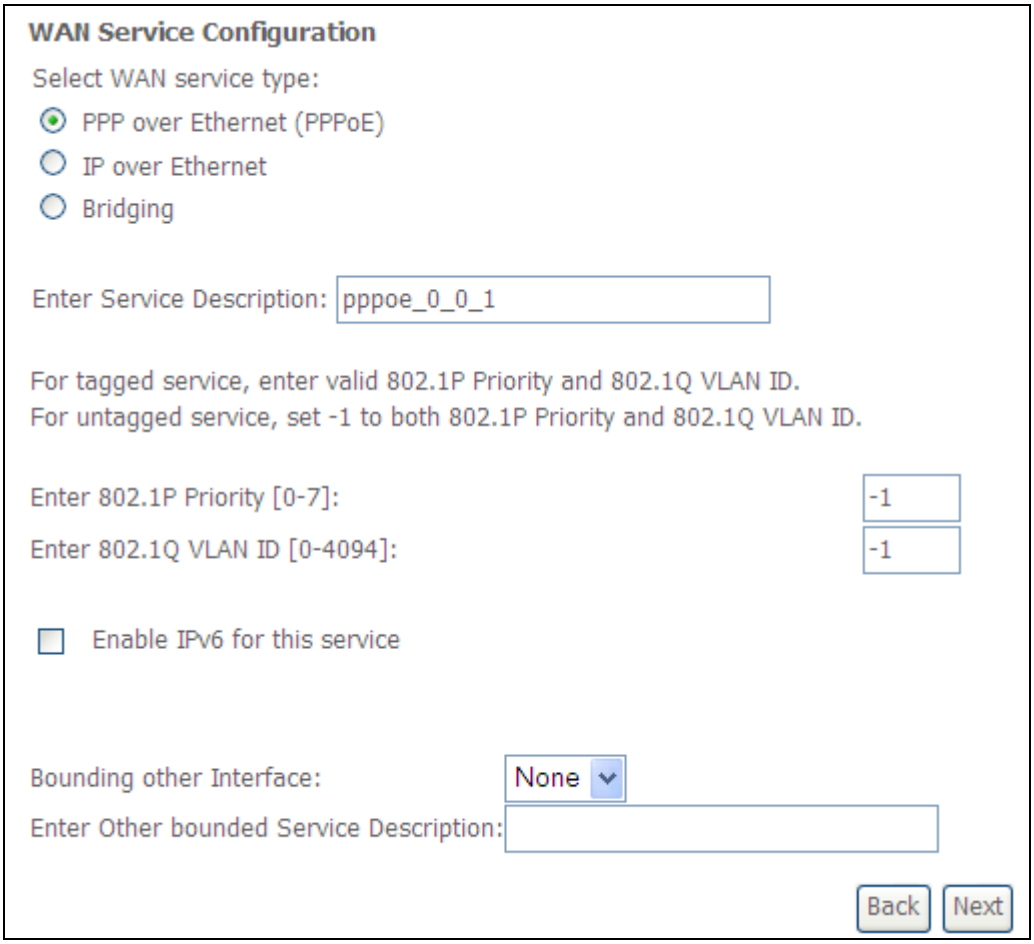
STEP 1: Go to the Advanced Setup → WAN Service screen.



STEP 2: Click **Add** to create a WAN connection. The following screen will display.


WAN Service Interface Configuration
Select a layer 2 interface for this service
Note: For ATM interface, the descriptor string is (portId_vpi_vci)
For PTM interface, the descriptor string is (portId_high_low)
Where portId=0 --> DSL Latency PATH0
portId=1 --> DSL Latency PATH1
portId=4 --> DSL Latency PATH0&1
low =0 --> Low PTM Priority not set
low =1 --> Low PTM Priority set
high =0 --> High PTM Priority not set
high =1 --> High PTM Priority set
eth1/ENET1
Back
Next

STEP 3: Choose a layer 2 interface from the drop-down box and click **Next**. The WAN Service Configuration screen will display as shown below.


WAN Service Configuration
Select WAN service type:
PPP over Ethernet (PPPoE)
IP over Ethernet
Bridging
Enter Service Description: pppoe_0_0_1
For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.
Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Enable IPv6 for this service
Bounding other Interface: None
Enter Other bounded Service Description:
Back
Next

NOTE:	The WAN services shown here are those supported by the layer 2 interface you selected in the previous step. If you wish to change your selection click the **Back** button and select a different layer 2 interface.

STEP 4: For VLAN Mux Connections only, you must enter Priority & VLAN ID tags.

STEP 5: You will now follow the instructions specific to the WAN service type you wish to establish. This list should help you locate the correct procedure:

(1) For F2.1 PPP over ETHERNET (PPPoE), go to page 154.
(2) For G2.2 IP over ETHERNET (IPoE), go to page 159.
(3) For G2.3 Bridging, go to page 164.
(4) For

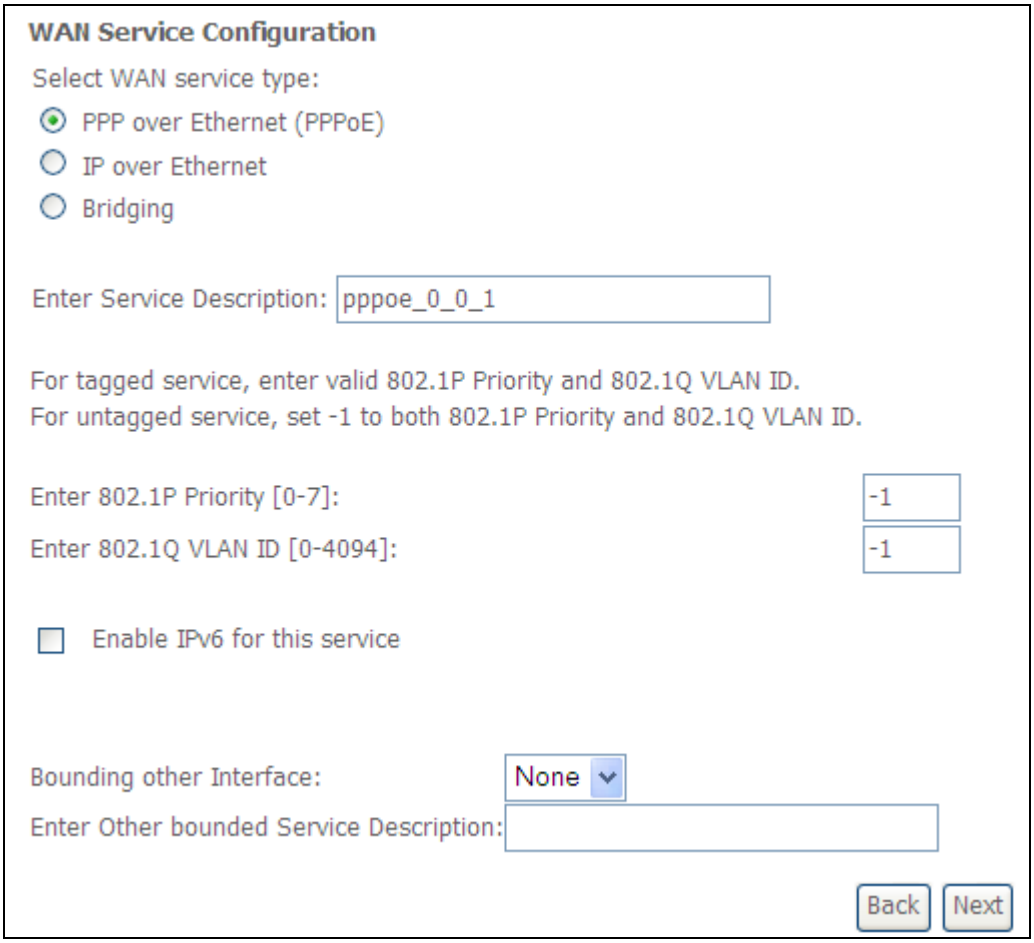
G2.4 PPP over ATM (PPPoA), go to page 166.

(5) For G2.5 IP over ATM (IPoA), go to page 171.

The subsections that follow continue the WAN service setup procedure.

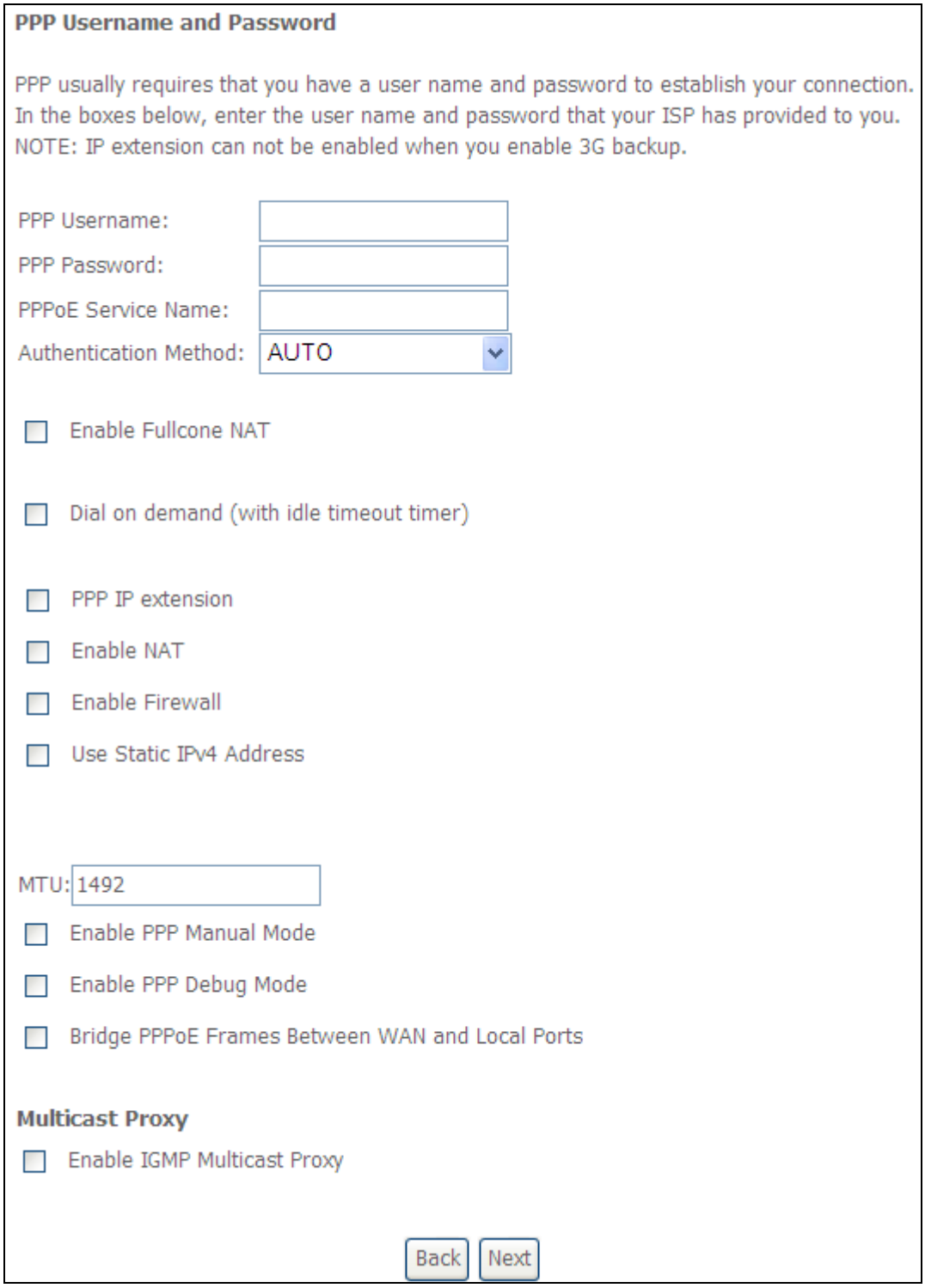
F2.1 PPP over ETHERNET (PPPoE)

STEP 1: Select the PPP over Ethernet radio button and click **Next**. You can also enable IPv6 by ticking the checkbox ☑ at the bottom of this screen.


WAN Service Configuration
Select WAN service type:
PPP over Ethernet (PPPoE)
IP over Ethernet
Bridging
Enter Service Description: pppoe_0_0_1
For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.
Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Enable IPv6 for this service
Bounding other Interface: None
Enter Other bounded Service Description:
Back
Next

Heading	Description
Enable IPv6 for this service	Enable/Disable IPv6 function
Bounding other Interface	For this service, select an interface
Enter Other bounded Service Description	Enter this service name

STEP 2: On the next screen, enter the PPP settings as provided by your ISP. Click **Next** to continue or click **Back** to return to the previous step.


PPP Username and Password
PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.
NOTE: IP extension can not be enabled when you enable 3G backup.
PPP Username:
PPP Password:
PPPoE Service Name:
Authentication Method:
AUTO
Enable Fullcone NAT
Dial on demand (with idle timeout timer)
PPP IP extension
Enable NAT
Enable Firewall
Use Static IPv4 Address
MTU:
1492
Enable PPP Manual Mode
Enable PPP Debug Mode
Bridge PPPoE Frames Between WAN and Local Ports
Multicast Proxy
Enable IGMP Multicast Proxy
Back
Next

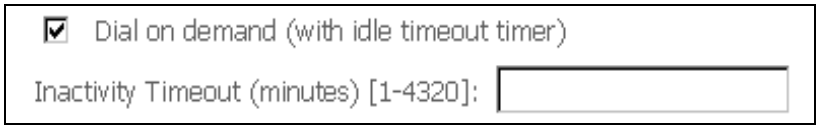
The settings shown above are described below.

PPP SETTINGS

The PPP Username, PPP password and the PPPoE Service Name entries are dependent on the particular requirements of the ISP. The user name can be a maximum of 256 characters and the password a maximum of 32 characters in length. For Authentication Method, choose from AUTO, PAP, CHAP, and MSCHAP.

ENABLE FULLCONE NAT
This option becomes available when NAT is enabled. Known as one-to-one NAT, all requests from the same internal IP address and port are mapped to the same external IP address and port. An external host can send a packet to the internal host, by sending a packet to the mapped external address.

DIAL ON DEMAND
The VI-3223u can be configured to disconnect if there is no activity for a period of time by selecting the **Dial on demand** checkbox ☑. You must also enter an inactivity timeout period in the range of 1 to 4320 minutes.



PPP IP EXTENSION
The PPP IP Extension is a special feature deployed by some service providers. Unless your service provider specifically requires this setup, do not select it.

PPP IP Extension does the following:

- Allows only one PC on the LAN.
- Disables NAT and Firewall.
- The device becomes the default gateway and DNS server to the PC through DHCP using the LAN interface IP address.
- The device extends the IP subnet at the remote service provider to the LAN PC. i.e. the PC becomes a host belonging to the same IP subnet.
- The device bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the device's LAN IP address.
- The public IP address assigned by the remote side using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the PC LAN interface through DHCP. Only one PC on the LAN can be connected to the remote, since the DHCP server within the device has only a single IP address to assign to a LAN device.

ENABLE NAT
If the LAN is configured with a private IP address, the user should select this checkbox ☑. The NAT submenu will appear in the Advanced Setup menu after reboot. On the other hand, if a private IP address is not used on the LAN side (i.e. the LAN side is using a public IP), this checkbox ☑ should not be selected to free up system resources for better performance.

ENABLE FIREWALL
If this checkbox ☑ is selected, the Security submenu will be displayed on the Advanced Setup menu after reboot. If firewall is not necessary, this checkbox ☑ should not be selected to free up system resources for better performance.

USE STATIC IPv4 ADDRESS
Unless your service provider specially requires it, do not select this checkbox ☑. If selected, enter the static IP address in the **IPv4 Address** field. Don't forget to adjust the IP configuration to Static IP Mode as described in section 0.

MTU
Maximum Transmission Unit. The size (in bytes) of largest protocol data unit which the layer can pass onwards. This value is 1492 for PPPoE.

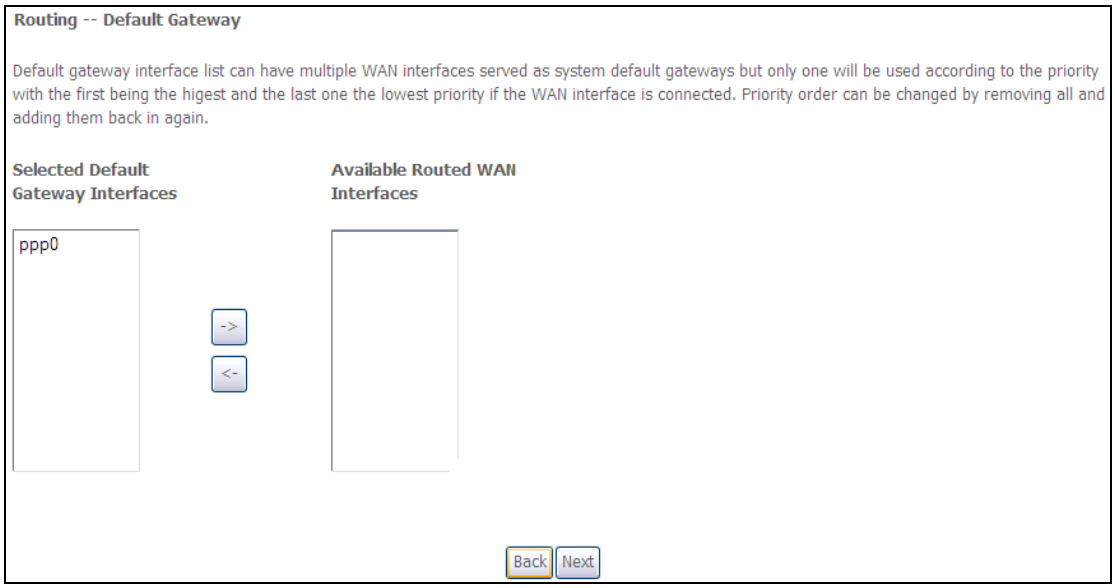
ENABLE PPP Manual MODE
Use this button to manually connect/disconnect PPP sessions.

ENABLE PPP DEBUG MODE
When this option is selected, the system will put more PPP connection information into the system log. This is for debugging errors and not for normal usage.

BRIDGE PPPOE FRAMES BETWEEN WAN AND LOCAL PORTS
(This option is hidden when PPP IP Extension is enabled)
When Enabled, this creates local PPPoE connections to the WAN side. Enable this option only if all LAN-side devices are running PPPoE clients, otherwise disable it. The VI-3223u supports pass-through PPPoE sessions from the LAN side while simultaneously running a PPPoE client from non-PPPoE LAN devices.

ENABLE IGMP MULTICAST PROXY
Tick the checkbox ☑ to enable Internet Group Membership Protocol (IGMP) multicast. This protocol is used by IPv4 hosts to report their multicast group memberships to any neighboring multicast routers.

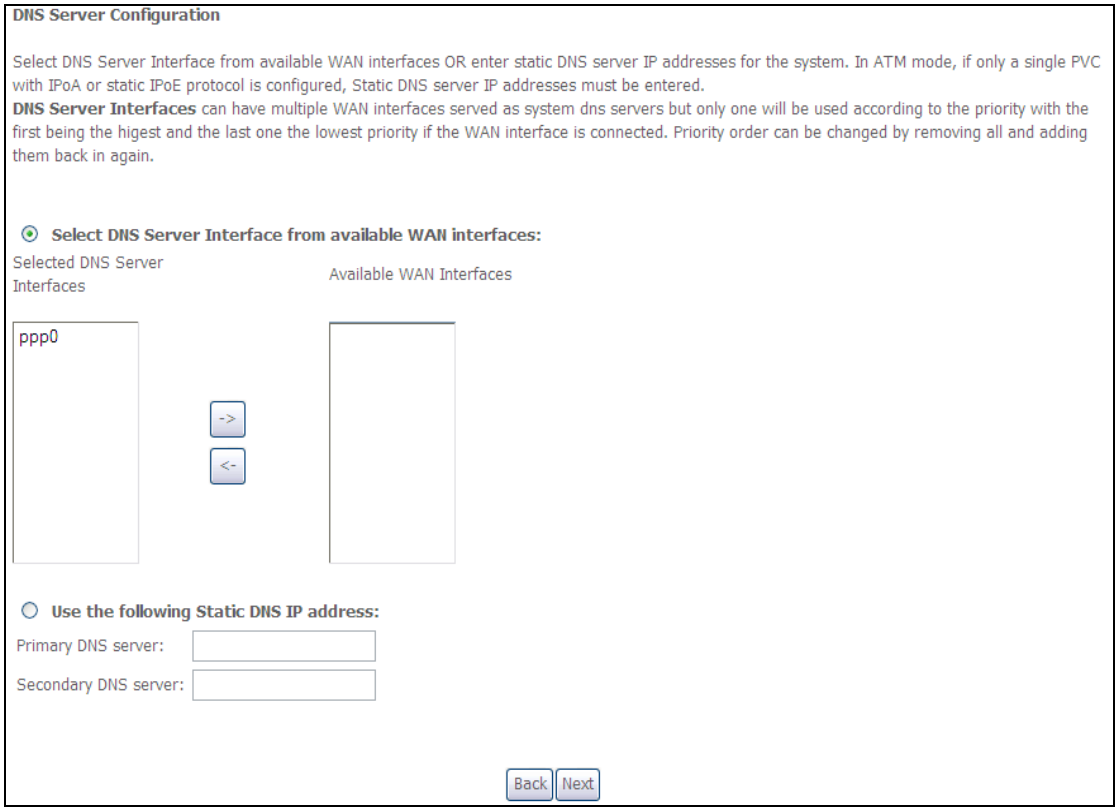
STEP 3: Choose an interface to be the default gateway.


Routing -- Default Gateway
Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Selected Default Gateway Interfaces
Available Routed WAN Interfaces
ppp0
->
<-
Back
Next

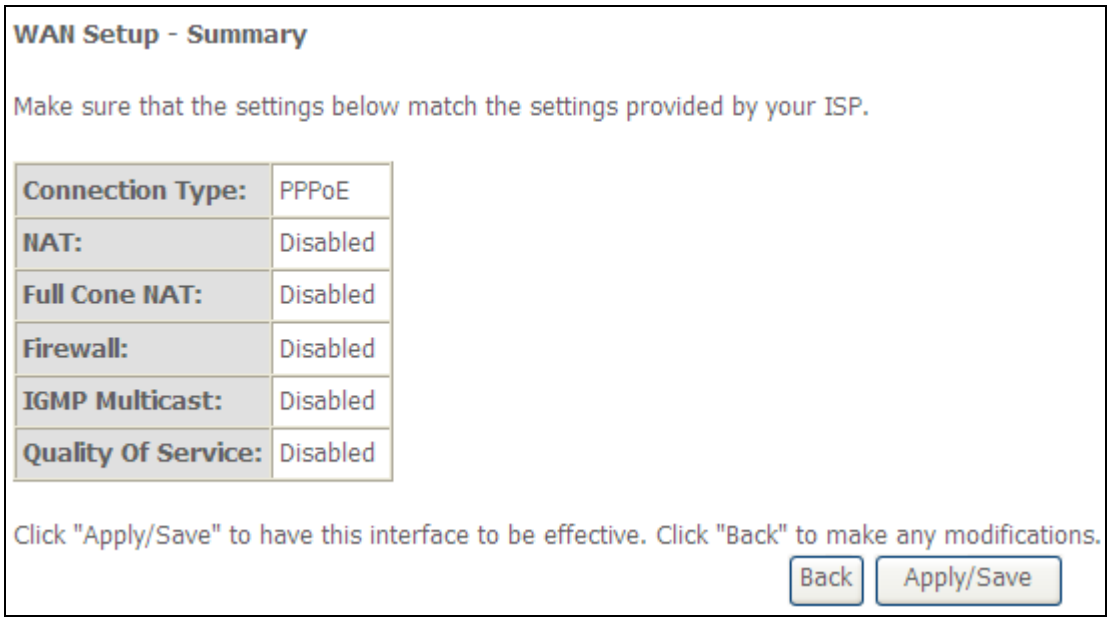
Click **Next** to continue or click **Back** to return to the previous step.

STEP 4:

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.


DNS Server Configuration
Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.
DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Select DNS Server Interface from available WAN interfaces:
Selected DNS Server Interfaces
Available WAN Interfaces
ppp0
->
<-
Use the following Static DNS IP address:
Primary DNS server:
Secondary DNS server:
Back
Next

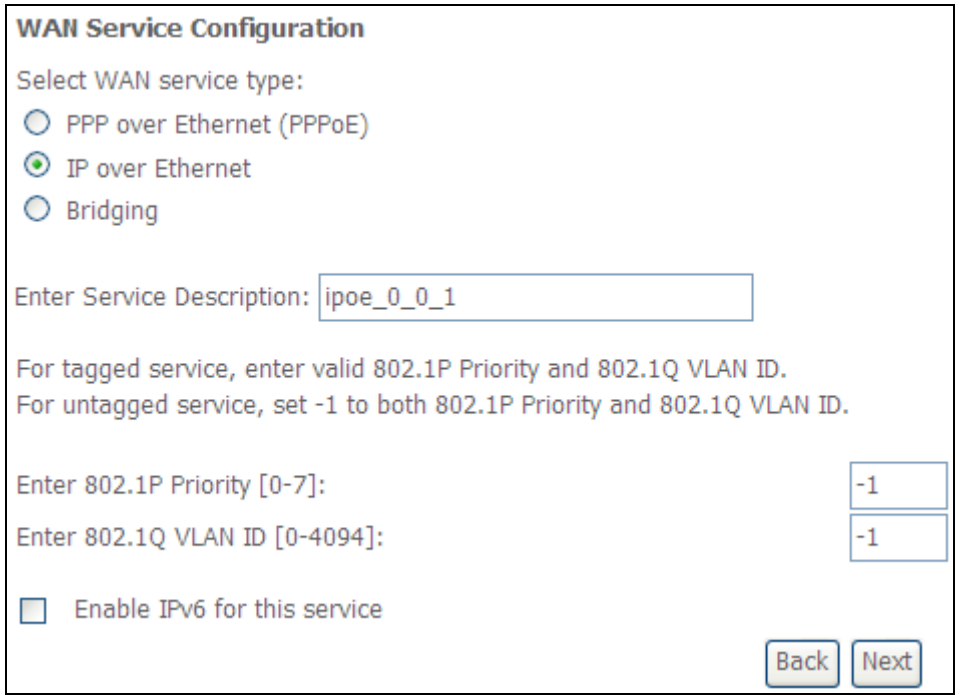
STEP 5: Click **Next** to continue or click **Back** to return to the previous step. The WAN Setup - Summary screen shows a preview of the WAN service you have configured. Check these settings and click **Apply/Save** if they are correct, or click **Back** to modify them.


WAN Setup - Summary
Make sure that the settings below match the settings provided by your ISP.
Connection Type: PPPoE
NAT: Disabled
Full Cone NAT: Disabled
Firewall: Disabled
IGMP Multicast: Disabled
Quality Of Service: Disabled
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.
Back
Apply/Save

After clicking **Apply/Save**, the new service should appear on the main screen. To activate it you must reboot. Go to Management → Reboot and click **Reboot**.

G2.2 IP over ETHERNET (IPoE)

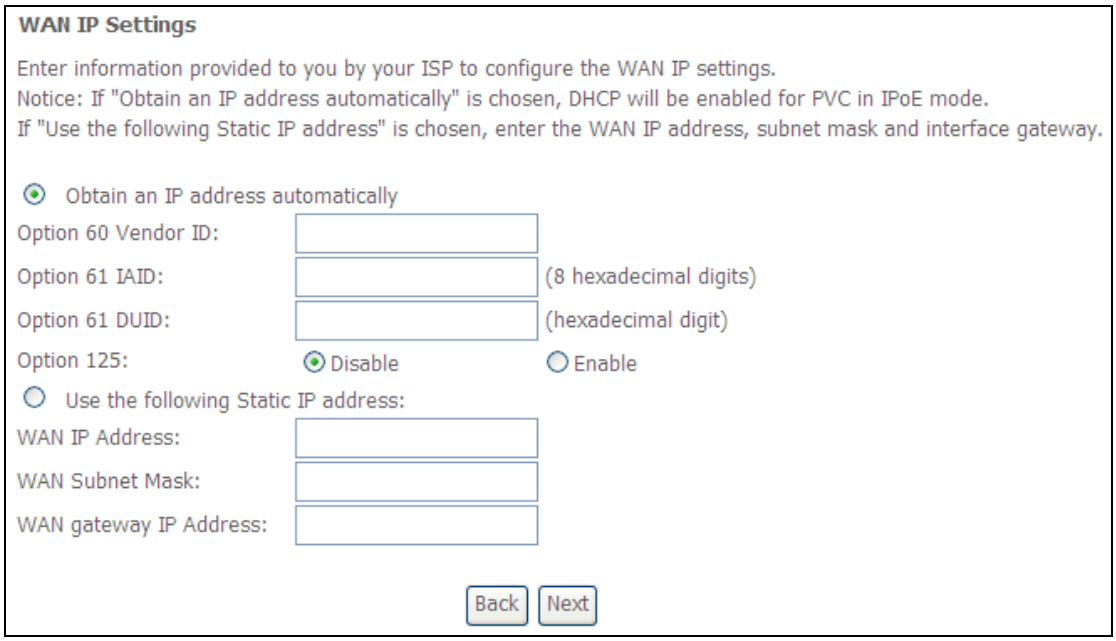
STEP 1: Select the IP over Ethernet radio button and click **Next**. You can also enable IPv6 by ticking the checkbox ☑ at the bottom of this screen.


WAN Service Configuration
Select WAN service type:
PPP over Ethernet (PPPoE)
IP over Ethernet
Bridging
Enter Service Description: ipoe_0_0_1
For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.
Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Enable IPv6 for this service
Back
Next

Enable IPv6 for this service:

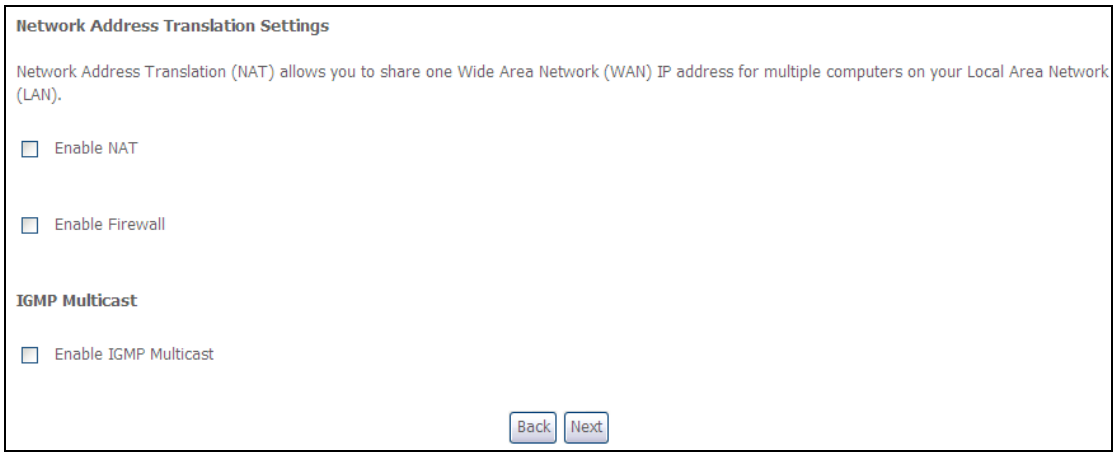
Click button to enable IPv6 service.

STEP 2: The WAN IP settings screen provides access to the DHCP server settings. You can select the **Obtain an IP address automatically** radio button to enable DHCP (use the DHCP Options only if necessary). However, if you prefer, you can instead use the **Static IP address** method to assign WAN IP address, Subnet Mask and Default Gateway manually.


WAN IP Settings
Enter information provided to you by your ISP to configure the WAN IP settings.
Notice: If "Obtain an IP address automatically" is chosen, DHCP will be enabled for PVC in IPoE mode.
If "Use the following Static IP address" is chosen, enter the WAN IP address, subnet mask and interface gateway.
Obtain an IP address automatically
Option 60 Vendor ID:
Option 61 IAID: (8 hexadecimal digits)
Option 61 DUID: (hexadecimal digit)
Option 125: Disable Enable
Use the following Static IP address:
WAN IP Address:
WAN Subnet Mask:
WAN gateway IP Address:
Back
Next

Click **Next** to continue or click **Back** to return to the previous step.

STEP 3: This screen provides access to NAT, Firewall and IGMP Multicast settings. Enable each by selecting the appropriate checkbox ☑. Click **Next** to continue or click **Back** to return to the previous step.


Network Address Translation Settings
Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).
Enable NAT
Enable Firewall
IGMP Multicast
Enable IGMP Multicast
Back
Next

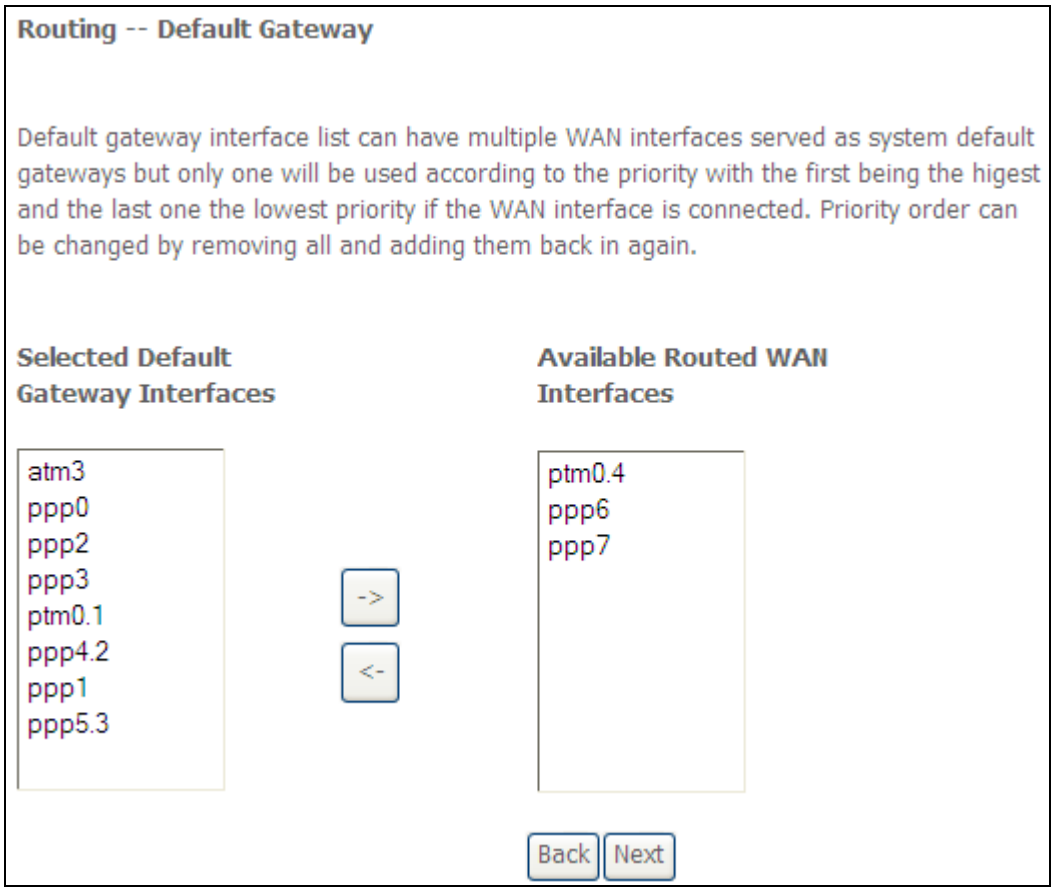
ENABLE NAT
If the LAN is configured with a private IP address, the user should select this checkbox ☑. The NAT submenu will appear in the Advanced Setup menu after reboot. On the other hand, if a private IP address is not used on the LAN side (i.e. the LAN side is using a public IP), this checkbox ☑ should not be selected, so as to free up system resources for improved performance.

ENABLE FULLCONE NAT
This option becomes available when NAT is enabled. Known as one-to-one NAT, all requests from the same internal IP address and port are mapped to the same external IP address and port. An external host can send a packet to the internal host, by sending a packet to the mapped external address.

ENABLE FIREWALL
If this checkbox ☑ is selected, the Security submenu will be displayed on the Advanced Setup menu after reboot. If firewall is not necessary, this checkbox ☑ should not be selected so as to free up system resources for better performance.

ENABLE IGMP MULTICAST
Tick the checkbox ☑ to enable Internet Group Membership Protocol (IGMP) multicast. IGMP is a protocol used by IPv4 hosts to report their multicast group memberships to any neighboring multicast routers.

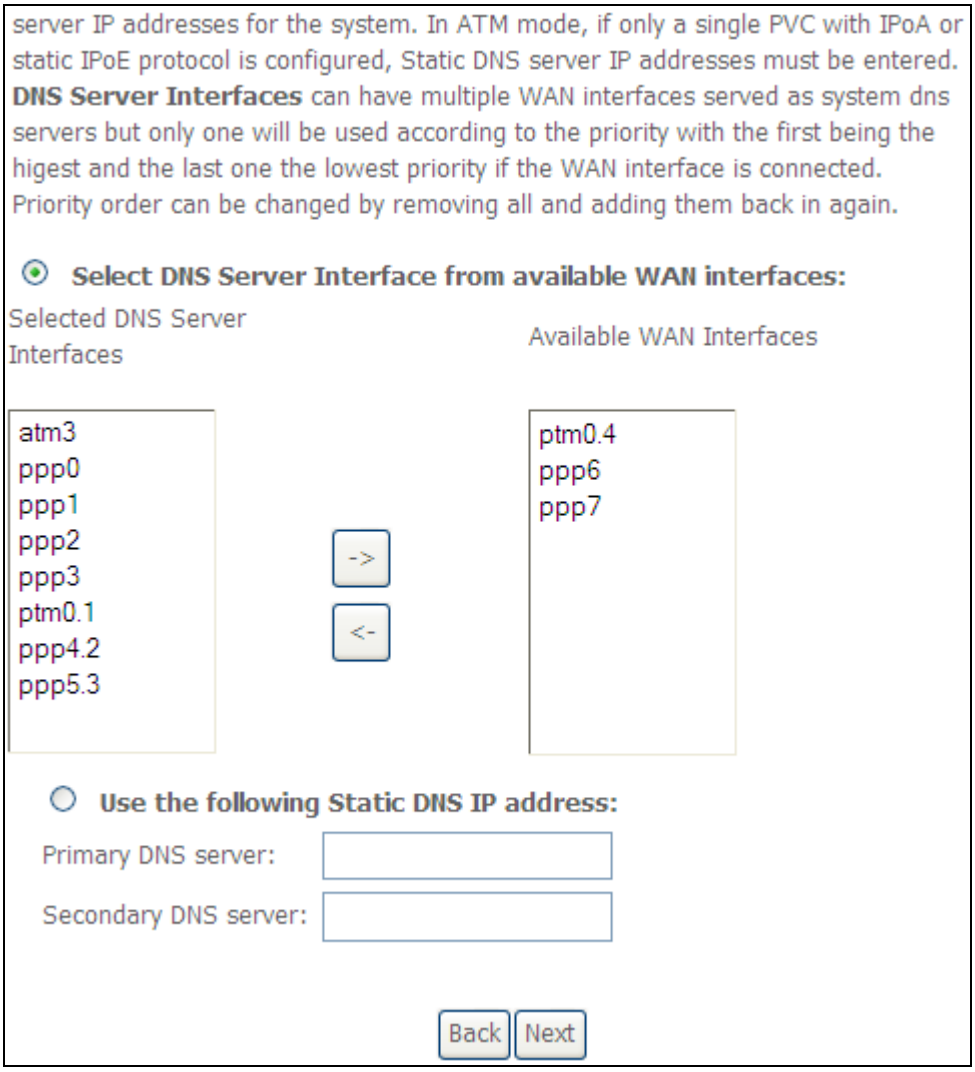
STEP 4: Choose an interface to be the default gateway.


Routing -- Default Gateway
Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Selected Default Gateway Interfaces
Available Routed WAN Interfaces
atm3
ppp0
ppp2
ppp3
ptm0.1
ppp4.2
ppp1
ppp5.3
->
<-
ptm0.4
ppp6
ppp7
Back
Next

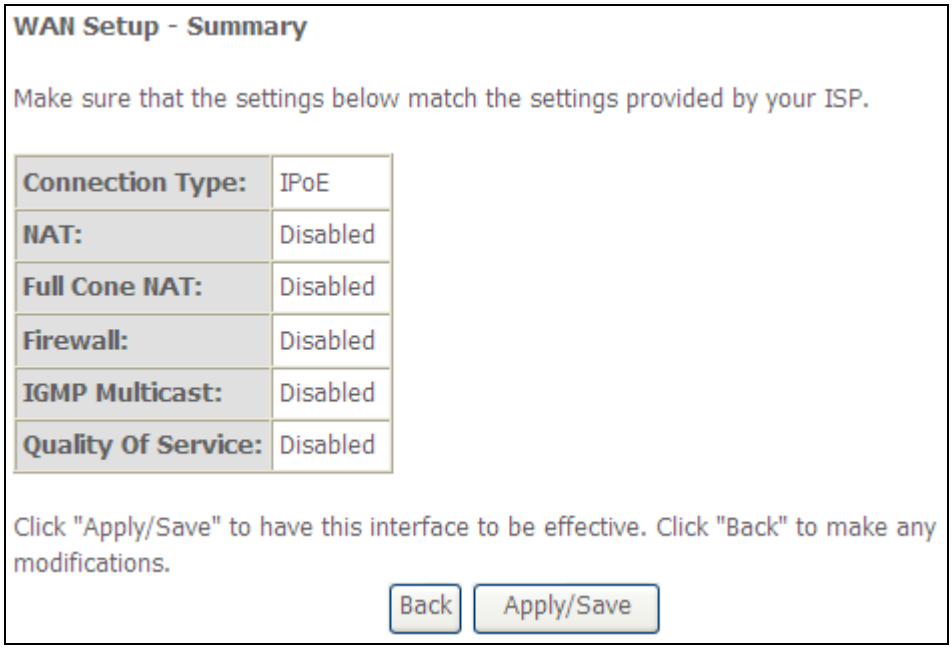
Click **Next** to continue or click **Back** to return to the previous step.

STEP 5:

Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.


server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.
DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected.
Priority order can be changed by removing all and adding them back in again.
Select DNS Server Interface from available WAN interfaces:
Selected DNS Server Interfaces
Available WAN Interfaces
atm3
ppp0
ppp1
ppp2
ppp3
ptm0.1
ppp4.2
ppp5.3
->
<-
ptm0.4
ppp6
ppp7
Use the following Static DNS IP address:
Primary DNS server:
Secondary DNS server:
Back
Next

STEP 6: The WAN Setup - Summary screen shows a preview of the WAN service you have configured. Check these settings and click **Apply/Save** if they are correct, or click **Back** to modify them.

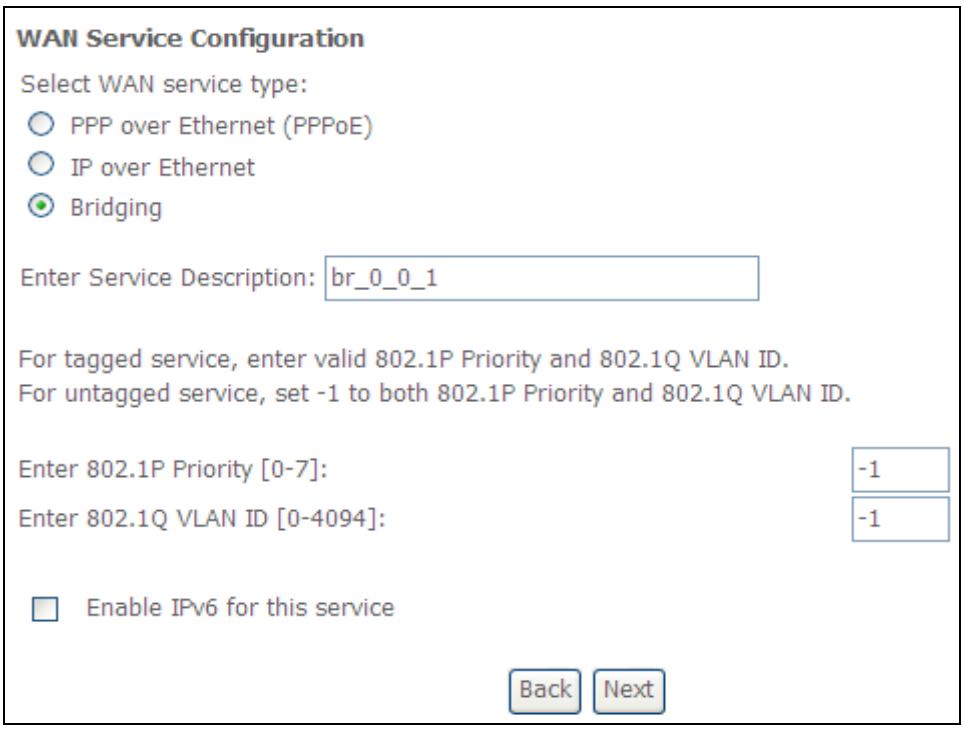

WAN Setup - Summary
Make sure that the settings below match the settings provided by your ISP.
Connection Type: IPoE
NAT: Disabled
Full Cone NAT: Disabled
Firewall: Disabled
IGMP Multicast: Disabled
Quality Of Service: Disabled
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.
Back
Apply/Save

After clicking **Apply/Save**, the new service should appear on the main screen. To activate it you must reboot. Go to Management → Reboot and click **Reboot**.

G2.3 Bridging

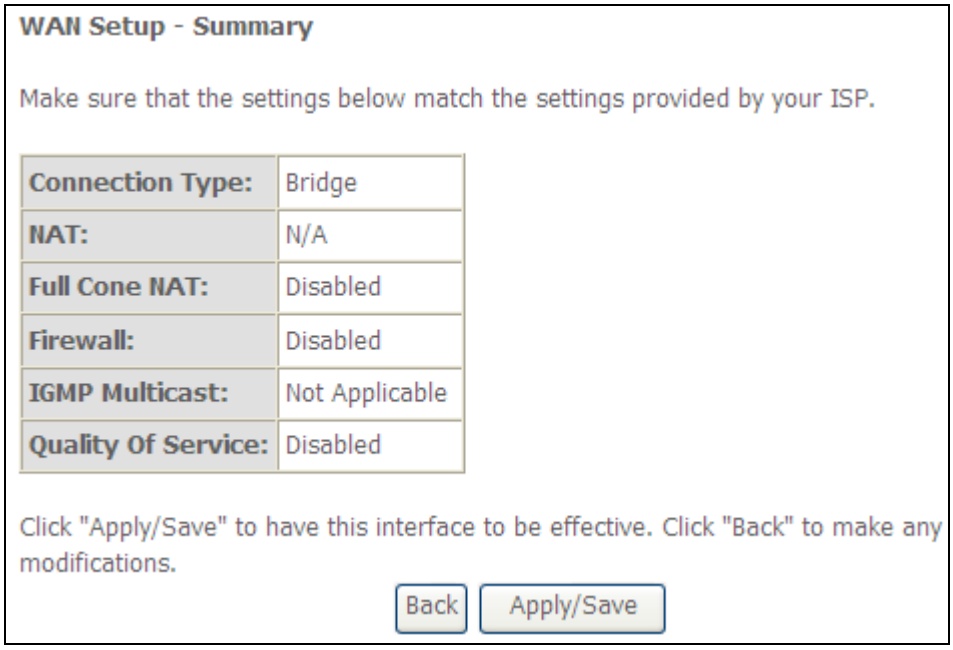
NOTE:	This connection type is not available on the Ethernet WAN interface.

STEP 1: Select the Bridging radio button and click **Next**. You can also enable IPv6 by ticking the checkbox ☑ at the bottom of this screen.


WAN Service Configuration
Select WAN service type:
PPP over Ethernet (PPPoE)
IP over Ethernet
Bridging
Enter Service Description: br_0_0_1
For tagged service, enter valid 802.1P Priority and 802.1Q VLAN ID.
For untagged service, set -1 to both 802.1P Priority and 802.1Q VLAN ID.
Enter 802.1P Priority [0-7]: -1
Enter 802.1Q VLAN ID [0-4094]: -1
Enable IPv6 for this service
Back
Next

Enable IPv6 for this service:
Click button to enable IPv6 service.

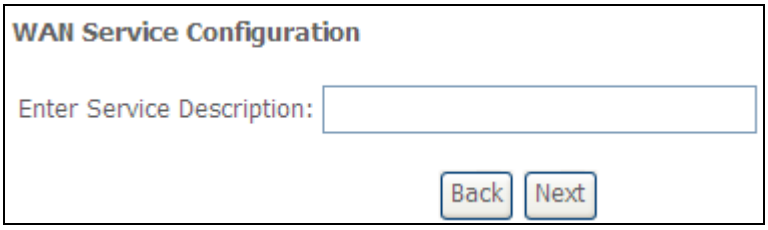
STEP 2: The WAN Setup - Summary screen shows a preview of the WAN service you have configured. Check these settings and click **Apply/Save** if they are correct, or click **Back** to return to the previous screen.


WAN Setup - Summary
Make sure that the settings below match the settings provided by your ISP.
Connection Type: Bridge
NAT: N/A
Full Cone NAT: Disabled
Firewall: Disabled
IGMP Multicast: Not Applicable
Quality Of Service: Disabled
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.
Back
Apply/Save

After clicking **Apply/Save**, the new service should appear on the main screen. To activate it you must reboot. Go to Management → Reboot and click **Reboot**.

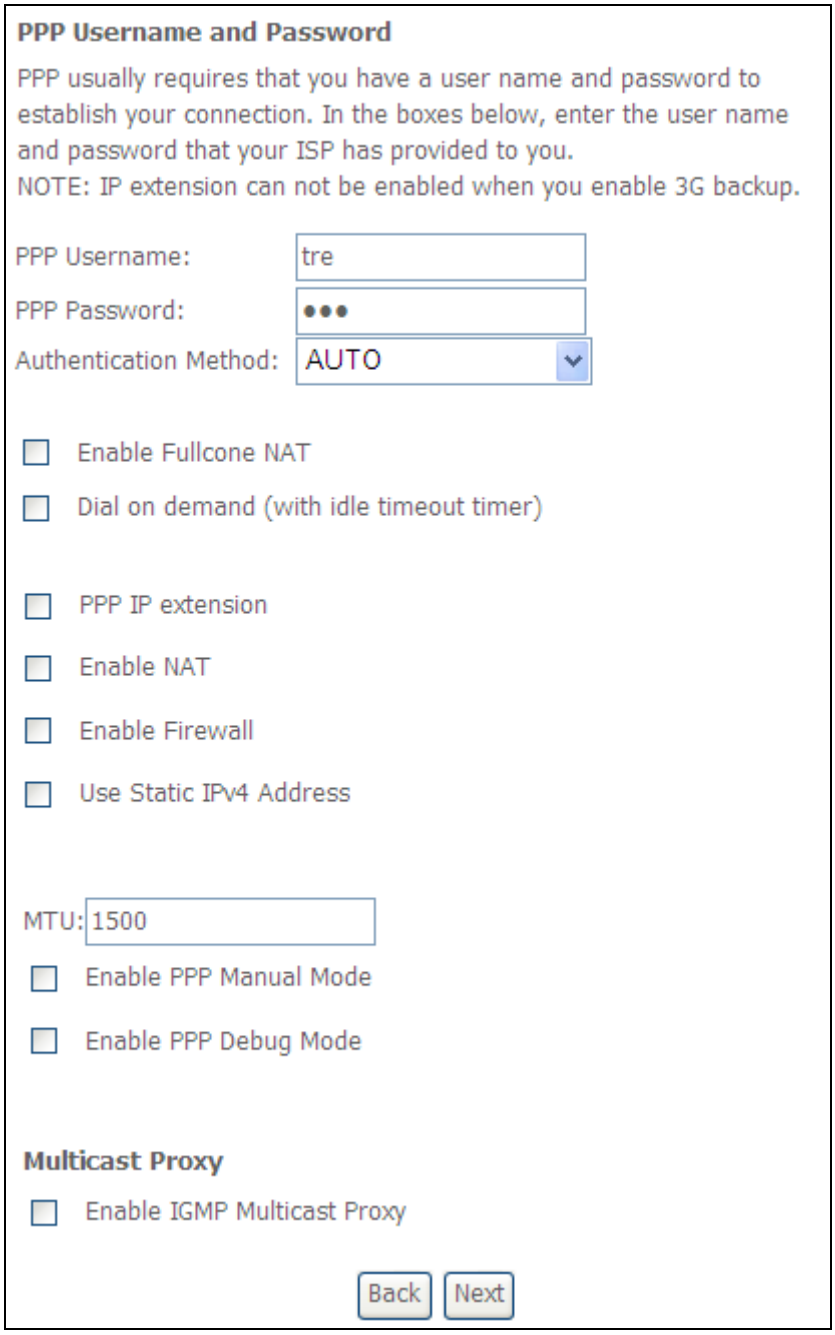
NOTE:	If this bridge connection is your only WAN service, the VI-3223u will be inaccessible for remote management or technical support from the WAN.

G2.4 PPP over ATM (PPPoA)



STEP 1: Click **Next** to continue.

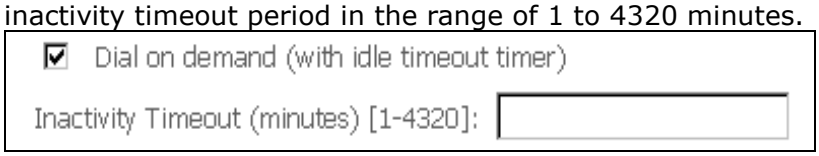
STEP 2: On the next screen, enter the PPP settings as provided by your ISP. Click **Next** to continue or click **Back** to return to the previous step.


PPP Username and Password
PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you.
NOTE: IP extension can not be enabled when you enable 3G backup.
PPP Username:
tre
PPP Password:
Authentication Method:
AUTO
Enable Fullcone NAT
Dial on demand (with idle timeout timer)
PPP IP extension
Enable NAT
Enable Firewall
Use Static IPv4 Address
MTU:
1500
Enable PPP Manual Mode
Enable PPP Debug Mode
Multicast Proxy
Enable IGMP Multicast Proxy
Back
Next

PPP SETTINGS
The PPP username and password are dependent on the requirements of the ISP. The user name can be a maximum of 256 characters and the password a maximum of 32 characters in length. (Authentication Method: AUTO, PAP, CHAP, or MSCHAP.)

ENABLE FULLCONE NAT
This option becomes available when NAT is enabled. Known as one-to-one NAT, all requests from the same internal IP address and port are mapped to the same external IP address and port. An external host can send a packet to the internal host, by sending a packet to the mapped external address.

DIAL ON DEMAND
The VI-3223u can be configured to disconnect if there is no activity for a period of time by selecting the **Dial on demand** checkbox ☑. You must also enter an inactivity timeout period in the range of 1 to 4320 minutes.



PPP IP EXTENSION
The PPP IP Extension is a special feature deployed by some service providers. Unless your service provider specifically requires this setup, do not select it.

PPP IP Extension does the following:

- Allows only one PC on the LAN.
- Disables NAT and Firewall.
- The device becomes the default gateway and DNS server to the PC through DHCP using the LAN interface IP address.
- The device extends the IP subnet at the remote service provider to the LAN PC. i.e. the PC becomes a host belonging to the same IP subnet.
- The device bridges the IP packets between WAN and LAN ports, unless the packet is addressed to the device's LAN IP address.
- The public IP address assigned by the remote side using the PPP/IPCP protocol is actually not used on the WAN PPP interface. Instead, it is forwarded to the PC LAN interface through DHCP. Only one PC on the LAN can be connected to the remote, since the DHCP server within the device has only a single IP address to assign to a LAN device.

ENABLE NAT
If the LAN is configured with a private IP address, the user should select this checkbox ☑. The NAT submenu will appear in the Advanced Setup menu after reboot. On the other hand, if a private IP address is not used on the LAN side (i.e. the LAN side is using a public IP), this checkbox ☑ should not be selected to free up system resources for better performance.

ENABLE FIREWALL
If this checkbox ☑ is selected, the Security submenu will be displayed on the Advanced Setup menu after reboot. If firewall is not necessary, this checkbox ☑ should not be selected to free up system resources for better performance.

USE STATIC IPv4 ADDRESS
Unless your service provider specially requires it, do not select this checkbox ☑. If selected, enter the static IP address in the **IP Address** field. Also, don't forget to adjust the IP configuration to Static IP Mode as described in section 0.

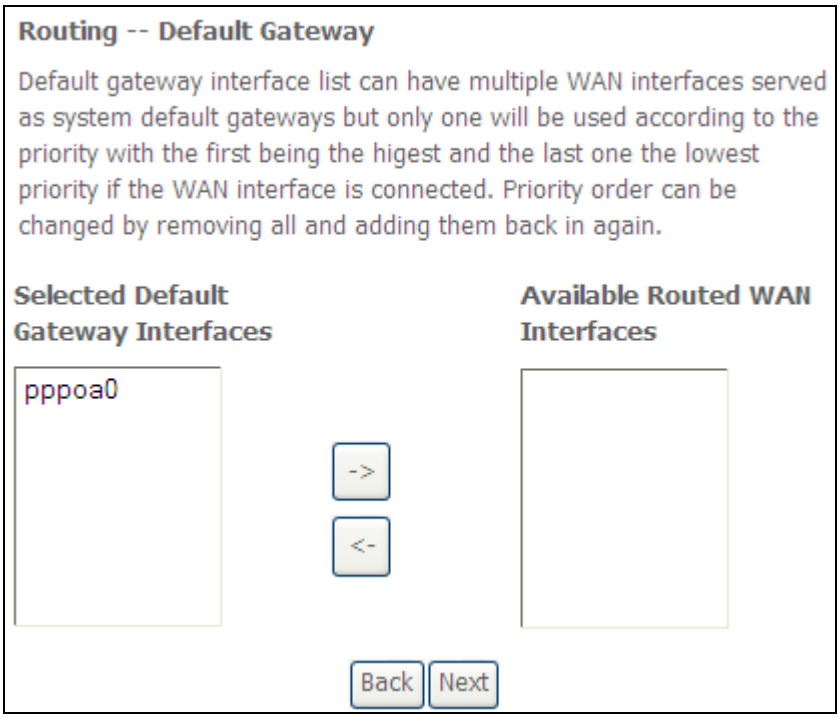
MTU
Maximum Transmission Unit. The size (in bytes) of largest protocol data unit which the layer can pass onwards. This value is 1500 for PPPoA.

ENABLE PPP MANUAL MODE
Use this button to manually connect/disconnect PPP sessions.

ENABLE PPP DEBUG MODE
When this option is selected, the system will put more PPP connection information into the system log. This is for debugging errors and not for normal usage.

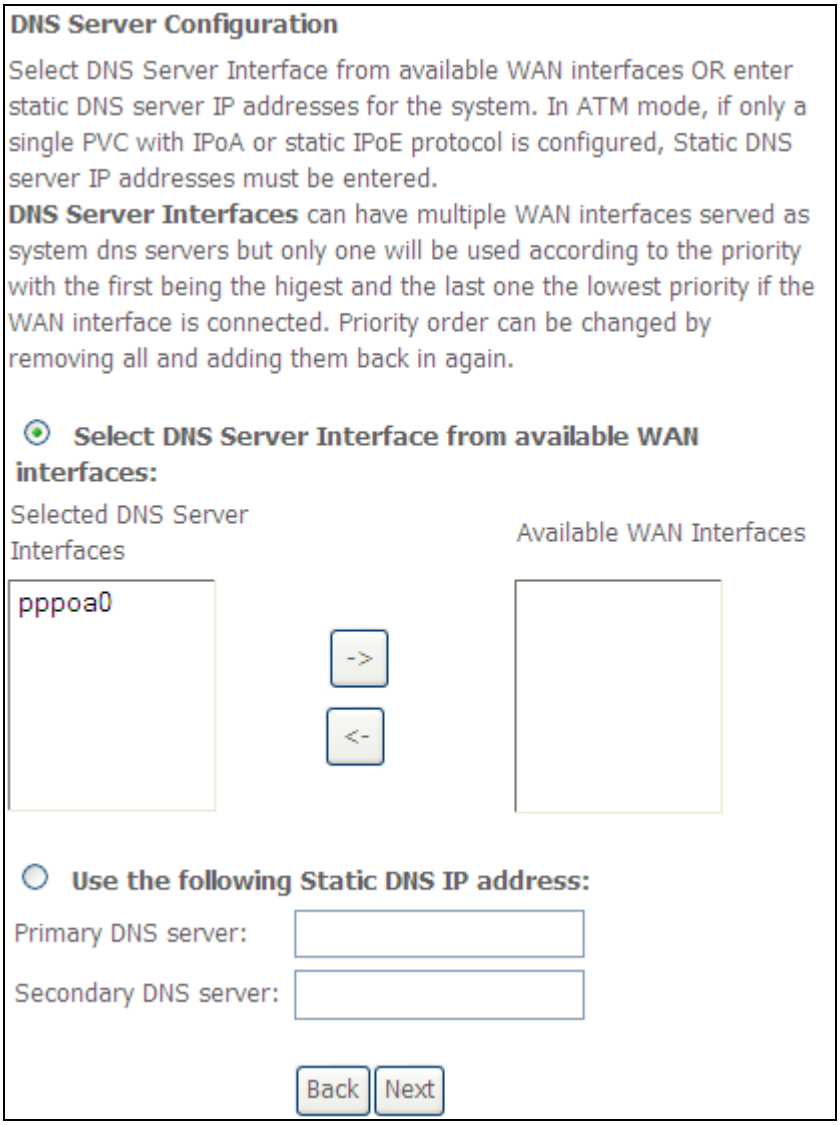
ENABLE IGMP MULTICAST
Tick the checkbox ☑ to enable Internet Group Membership Protocol (IGMP) multicast. IGMP is a protocol used by IPv4 hosts to report their multicast group memberships to any neighboring multicast routers.

STEP 3: Choose an interface to be the default gateway.


Routing -- Default Gateway
Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Selected Default Gateway Interfaces
Available Routed WAN Interfaces
pppoa0
->
<-
Back
Next

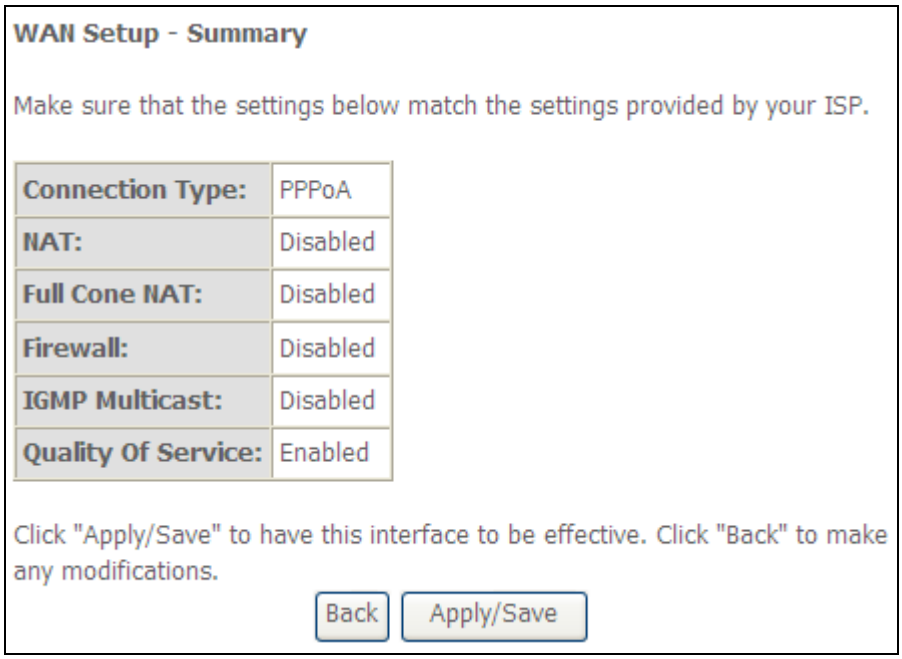
Click **Next** to continue or click **Back** to return to the previous step.

STEP 4: Choose an interface to be the default gateway.


DNS Server Configuration
Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.
DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Select DNS Server Interface from available WAN interfaces:
Selected DNS Server Interfaces
Available WAN Interfaces
pppoa0
->
<-
Use the following Static DNS IP address:
Primary DNS server:
Secondary DNS server:
Back
Next

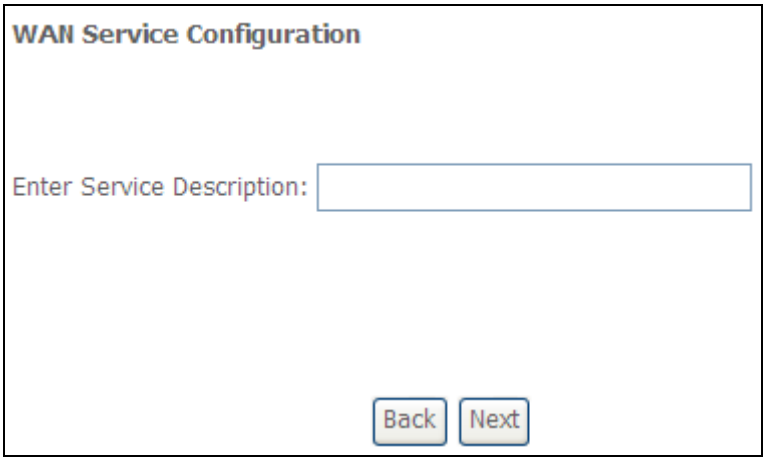
Click **Next** to continue or click **Back** to return to the previous step.

STEP 5: The WAN Setup - Summary screen shows a preview of the WAN service you have configured. Check these settings and click **Apply/Save** if they are correct, or click **Back** to modify them.


WAN Setup - Summary
Make sure that the settings below match the settings provided by your ISP.
Connection Type: PPPoA
NAT: Disabled
Full Cone NAT: Disabled
Firewall: Disabled
IGMP Multicast: Disabled
Quality Of Service: Enabled
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.
Back
Apply/Save

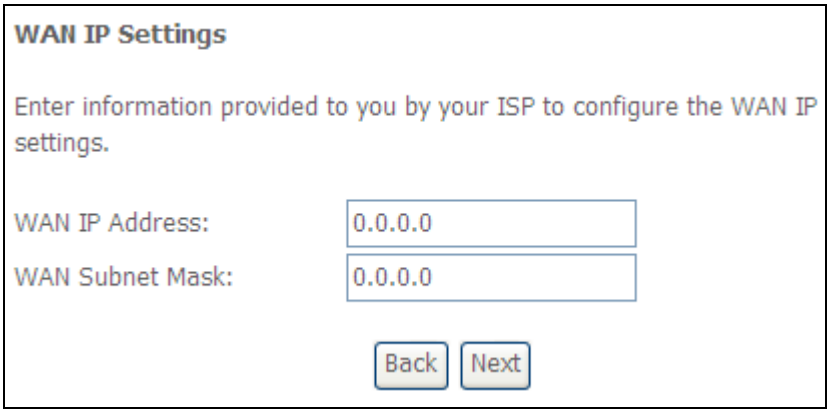
After clicking **Apply/Save**, the new service should appear on the main screen. To activate it you must reboot. Go to Management → Reboot and click **Reboot**.

G2.5 IP over ATM (IPoA)

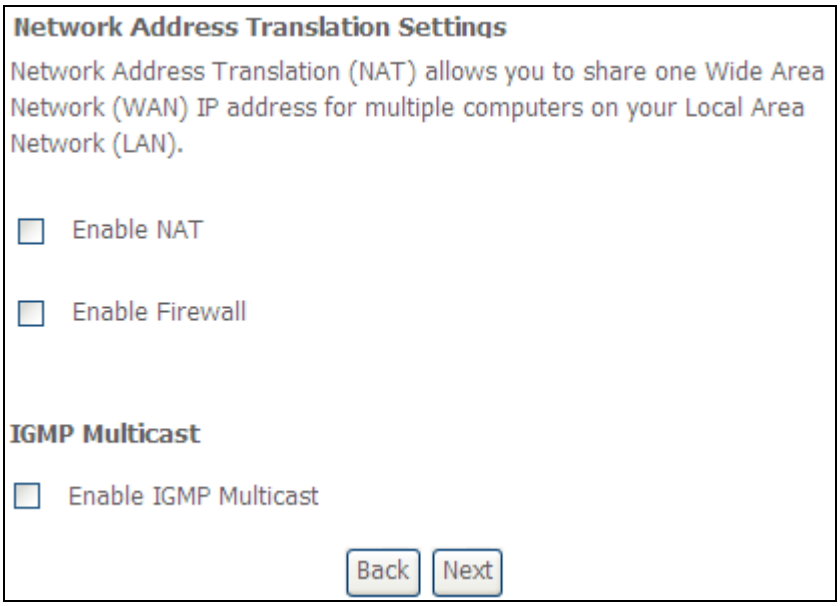


STEP 1: Click **Next** to continue.

STEP 2: Enter the WAN IP settings provided by your ISP. Click **Next** to continue.



STEP 3: This screen provides access to NAT, Firewall and IGMP Multicast settings. Enable each by selecting the appropriate checkbox ☑. Click **Next** to continue or click **Back** to return to the previous step.

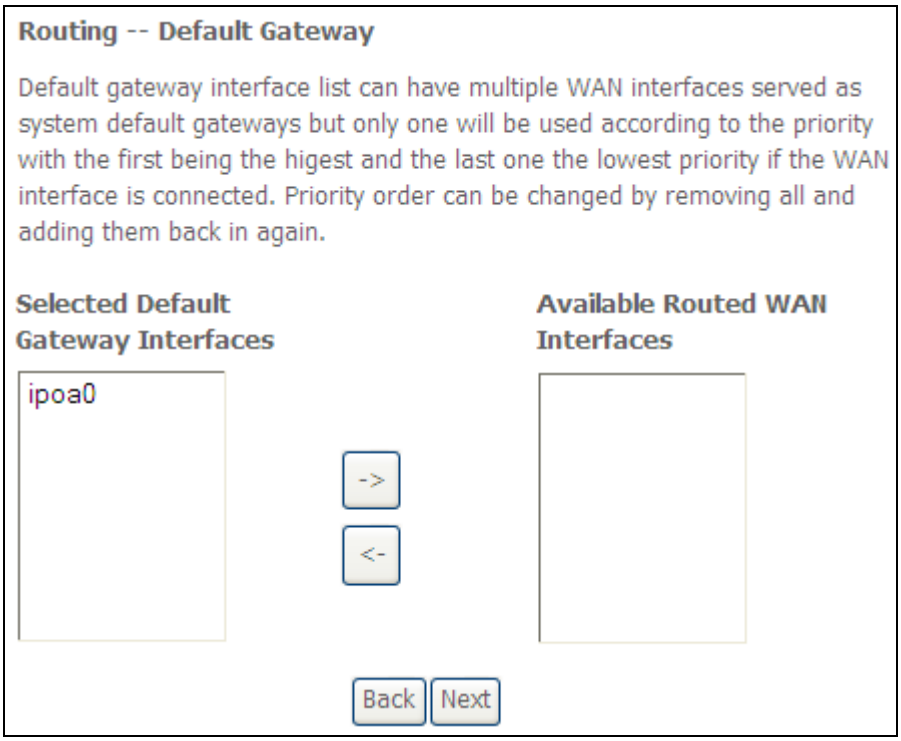

Network Address Translation Settings
Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).
Enable NAT
Enable Firewall
IGMP Multicast
Enable IGMP Multicast
Back
Next

ENABLE NAT
If the LAN is configured with a private IP address, the user should select this checkbox ☑. The NAT submenu will appear in the Advanced Setup menu after reboot. On the other hand, if a private IP address is not used on the LAN side (i.e. the LAN side is using a public IP), this checkbox ☑ should not be selected, so as to free up system resources for improved performance.

ENABLE FIREWALL
If this checkbox ☑ is selected, the Security submenu will be displayed on the Advanced Setup menu after reboot. If firewall is not necessary, this checkbox ☑ should not be selected so as to free up system resources for better performance.

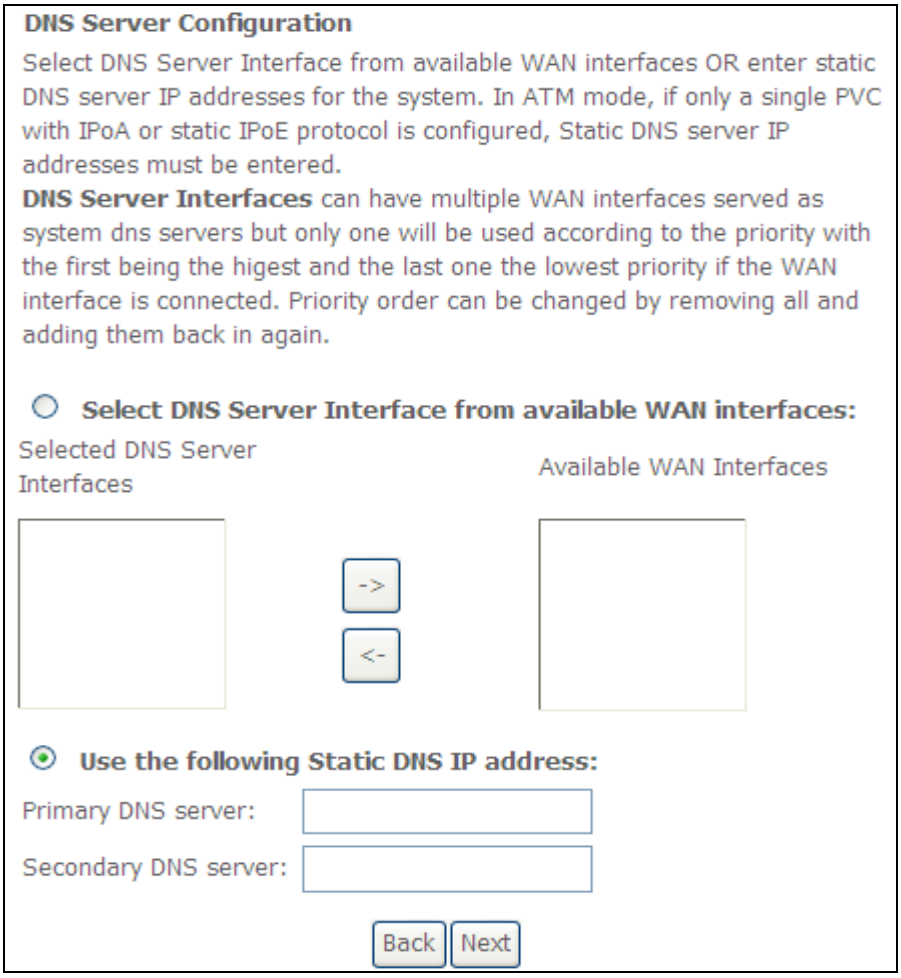
ENABLE IGMP MULTICAST
Tick the checkbox ☑ to enable Internet Group Membership Protocol (IGMP) multicast. IGMP is a protocol used by IPv4 hosts to report their multicast group memberships to any neighboring multicast routers.

STEP 4: Choose an interface to be the default gateway.


Routing -- Default Gateway
Default gateway interface list can have multiple WAN interfaces served as system default gateways but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Selected Default Gateway Interfaces
Available Routed WAN Interfaces
ipoa0
->
<-
Back
Next

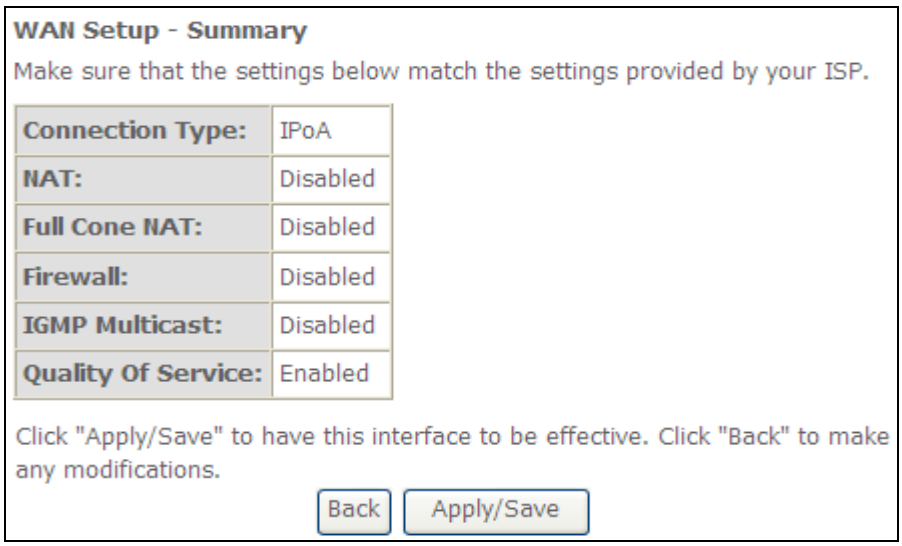
Click **Next** to continue or click **Back** to return to the previous step.

STEP 5: Choose an interface to be the default gateway.


DNS Server Configuration
Select DNS Server Interface from available WAN interfaces OR enter static DNS server IP addresses for the system. In ATM mode, if only a single PVC with IPoA or static IPoE protocol is configured, Static DNS server IP addresses must be entered.
DNS Server Interfaces can have multiple WAN interfaces served as system dns servers but only one will be used according to the priority with the first being the higest and the last one the lowest priority if the WAN interface is connected. Priority order can be changed by removing all and adding them back in again.
Select DNS Server Interface from available WAN interfaces:
Selected DNS Server Interfaces
Available WAN Interfaces
->
<-
Use the following Static DNS IP address:
Primary DNS server:
Secondary DNS server:
Back
Next

Click **Next** to continue or click **Back** to return to the previous step.

STEP 6: The WAN Setup - Summary screen shows a preview of the WAN service you have configured. Check these settings and click **Apply/Save** if they are correct, or click **Back** to modify them.


WAN Setup - Summary
Make sure that the settings below match the settings provided by your ISP.
Connection Type: IPoA
NAT: Disabled
Full Cone NAT: Disabled
Firewall: Disabled
IGMP Multicast: Disabled
Quality Of Service: Enabled
Click "Apply/Save" to have this interface to be effective. Click "Back" to make any modifications.
Back
Apply/Save

After clicking **Apply/Save**, the new service should appear on the main screen. To activate it you must reboot. Go to Management → Reboot and click **Reboot**.